FFS TANK TERMINALS (Pty) Ltd

TANK STORAGE FACILITY EXPANSION, MAYDON WHARF, KWA-ZULU NATAL

Draft Basic Assessment Report

JULY 2023

PUBLIC

FFS TANK TERMINALS (Pty) Ltd

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Draft Basic Assessment Report

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MAPS

GLOSSARY

Abbreviation	Definition
AEL	Atmospheric Emissions License
AIA	Approved Inspection Authority
AST	Aboveground Storage Tank
BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CSIR	Council for Scientific and Industrial Research
DFFE	Department of Forestry, Fisheries and Environment
DEG	Diethylene Glycol
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act 73 of 1989
EDTEA	Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ETA	eThekwini Transport Authority
FFS TT	FFS Tank Terminals (Pty) Ltd
GA	General Authorisation
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIIP	Good International Industry Practice

Abbreviation	Definition
GNR	Government Notice Regulation
ha	Hectares
HFO	Heavy Fuel Oil
HGV	Heavy Goods Vehicle
ICAO	International Civil Aviation Organisation
IDP	Integrated Development Plan
KZN	KwaZulu-Natal
LFL	Lower Flammable Limit
LOC	Loss of Containment
LOS	Level of Service
MEG	Mono Ethylene Glycol
MHI	Major Hazard Installation
MSDF	Municipal Spatial Development Framework
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management Protected Areas Act (No. 57 of 2003)
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NPAES	National Protected Area Expansion Strategy 2010
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
OTGC	Oiltanking Grindrod Calulo Terminals (OTGC) (Pty) Ltd
PCU	Passenger Car Unit
RIFSA	Road Infrastructure Strategic Framework for South Africa
S&EIA	Scoping and Environmental Impact Assessment
SABS	South African Bureau of Standards

Abbreviation	Definition
SACAA	South Africa Civil Aviation Act (Act No.13 of 2009)
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency
SANS	South African National Standards
SARPs	Standards and Recommended Practices
SAWS	South African Weather Service
SDF	Spatial Development Framework
SER	Stakeholder Engagement Report
SG	Surveyor General
TNPA	Transnet National Ports Authority (Pty) Ltd
UST	Underground Storage Tank
WSP	WSP Group Africa (Pty) Ltd
WUA	Water Use Authorisation
WUL	Water Use License

1

INTRODUCTION

1 INTRODUCTION

1.1 TERMS OF REFERENCE

WSP Group Africa (Pty) Ltd (WSP) has been appointed by FFS Tank Terminals (Pty) Ltd (FFS TT) to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed FFS TT tank storage facility expansion located in Maydon Wharf, Durban Harbour, in the eThekwini Municipality, KwaZulu Natal (**Figure 1-1**).

The proposed tank storage facility expansion is subject to a Basic Assessment (BA) Process in terms of NEMA (as amended) and Appendix 1 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and R327 on 7 April 2017. The competent authority (CA) for this BA process is the KwaZulu Natal (KZN) Department of Economic Development, Tourism and Environmental Affairs (EDTEA).

1.2 PURPOSE OF THIS REPORT

The BA process is an interdisciplinary procedure to ensure that environmental and social considerations are included in decisions regarding projects. Simply defined, the process aims to identify the possible environmental and social effects of a proposed activity and how those impacts can be mitigated.

In the context of this report, the purpose of the BA process is to inform decision-makers and the public of potential negative and positive consequences of the proposed FFS TT tank storage facility. This provides the CA sufficient information to make an informed decision with regards to granting or refusing the Environmental Authorisation (EA) applied for.

1.3 PROJECT OVERVIEW

FFS TT is situated in Maydon Wharf Precinct, Port of Durban. FFS TT currently operate a tank storage facility, importing and exporting various products to local and international markets, namely products such as Molasses, Mono Ethylene Glycol (MEG) , Diethylene Glycol (DEG), Base Oil, Bitumen and Heavy Fuel Oil..

FFS TT propose to expand their current tank storage capacity (Phase 2), by constructing additional storage tanks within their existing property footprint, allowing for the diversification of product storage which will include Residual Oil No 6 products (such as Bitumen and Heavy Fuel Oil) and Jet kerosene in the form of Illuminating Paraffin (Only required to fuel fire heaters). The expansion activities will include construction/installation of various sized storage tanks, Illuminating Paraffin fired heaters, pumps, loading gantries and piping.

On 12 April 2016, an Environmental Authorisation (EA) (DM/0071/2014) was issued for the upgrade of a bulk liquid storage (Bitumen and Heavy Fuel Oils (HFO's)) and Handling Facility. This included the decommissioning and demolition of ancillary infrastructure and two Molasses storage tanks, and the decommissioning of all existing structures and infrastructures at the Marine Training School site. The construction and operation of nineteen (19) new aboveground storage tanks (AST')s with bunding (for the storage of Caustic Soda, MEG, Vegetable oils/Base Oil) and ancillary infrastructure. This formed part of their Phase 1 activities.

Construction of six new pipelines and remaining associated infrastructure. Installation of a road tanker gantry and the operation of three remaining ASTs and two pipelines.

A first amendment to the EA (DM/Amend/0071/2017) was issued on 27 June 2017 for the storage of MEG and DEG and the change of contact details.

A second amendment to the EA (DM/AMEND/0071/2017/2021) was issued on 6 September 2021 for the storage of HFO and Bitumen in the existing tanks (Tank 2 and Tank 3).

A third amendment to the EA (DM0071/2014/AMEND/2017/2021/2022) was issued on 28 September 2022 for a name change from Oiltanking Grindrod Calulo Terminals (OTGC) (Pty) Ltd to FFS Tank Terminals (FFS TT) (Pty) Ltd.

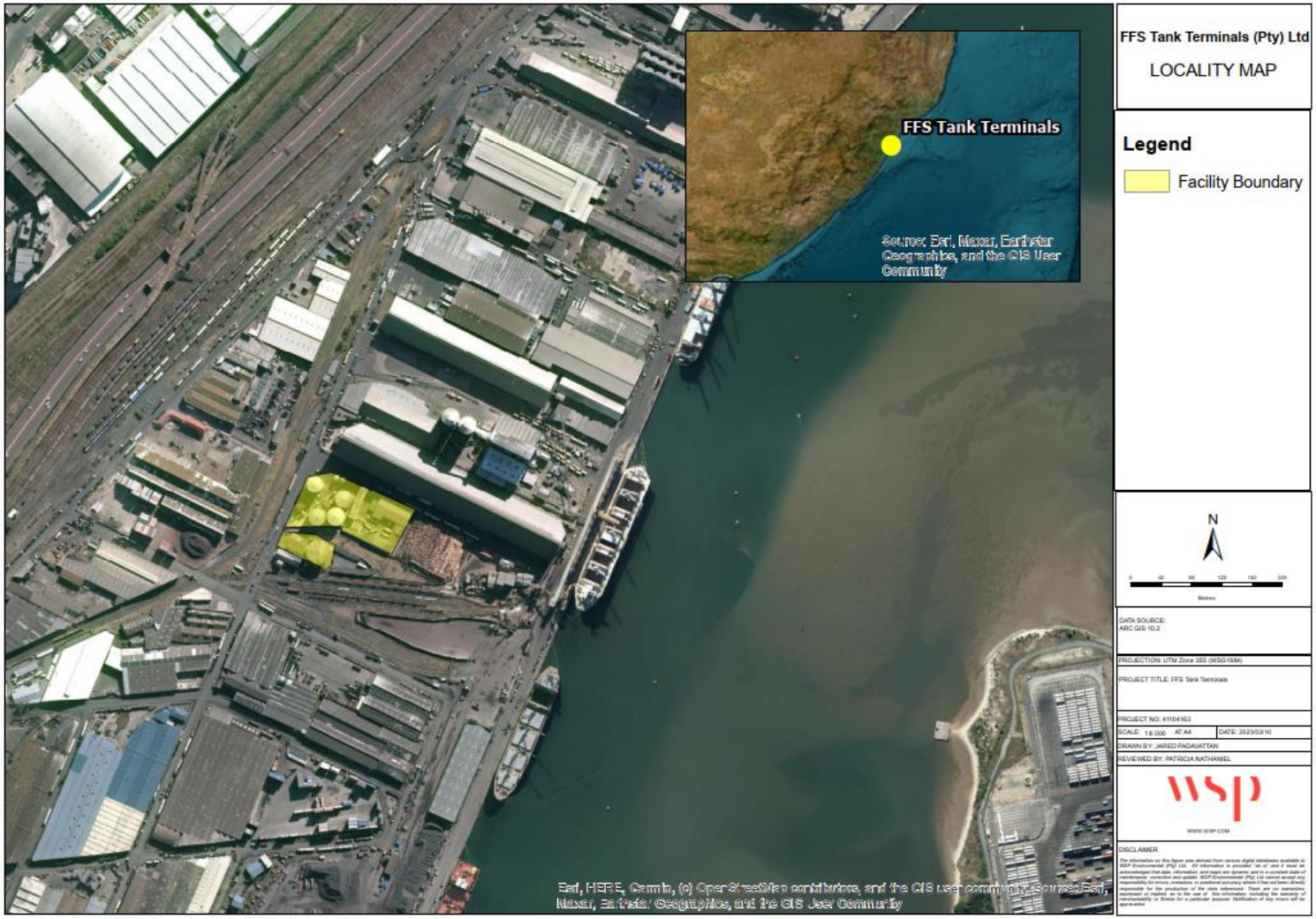


Figure 1-1 - Locality Map of FFS TT Tank Facility

1.4 DETAILS OF KEY ROLE PLAYERS

1.4.1 PROJECT PROPONENT

FFS Tank Terminals (Pty) Ltd is the project proponent (Applicant) for this application in respect of the proposed expansion and operation of the Tank Storage Facility. **Table 1-1** provides the relevant details of the project proponent.

Table 1-1 – Details of Project Proponent

Proponent:	FFS Tank Terminals (Pty) Ltd
Contact Person:	Mbuseleni Zulu
Postal Address	55 Johnstone Road Maydon Wharf Durban, 4001
Telephone:	031 205 6226
Email:	MbuseleniZ@ffs.co.za

1.4.2 COMPETENT AUTHORITY

A Pre-Application meeting was held on 16 November 2022 with the KZN EDTEA to discuss the project details, legislative requirements and public participation plan. There were no objections regarding EDTEA being assigned as the Competent Authority (CA) for reviewing and authorising the proposed project.

Table 1-2 provides the relevant details of the competent authority on the Project.

Table 1-2 – Competent Authority

Aspect	Competent Authority	Contact Details
Competent Authority: Environmental Authorisation	KwaZulu Natal Economic Development, Tourism and Environmental Affairs	Case Officer: Natasha Brijlal Control Environmental Officer, Environmental Impact Assessment Email: Natasha.Brijlal@kznedtea.gov.za Tel: 031 350 3015

1.4.3 COMMENTING AUTHORITY

The commenting authorities for the project include:

- EDTEA: Coastal unit;
- Ezemvelo KZN Wildlife;
- KZN Amafa and Research Institute;
- KZN Department of Human Settlements, Water and Sanitation;
- KZN Department of Transport;
- KZN Department of Health;
- KZN Department of Employment and Labour;

- eThekwini Municipality;
- eThekwini: Air Quality.

Refer to the Stakeholder Engagement Report (SER) in **Appendix D** for a full list of commenting authorities.

1.4.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP was appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-3** details the relevant contact details of the EAP.

Table 1-3 – Details of the EAP

EAP:	**WSP Group Africa (Pty) Ltd**
Contact Person:	Patricia Nathaniel
Physical Address:	1st Floor, Pharos House, 70 Buckingham Terrace, Westville, 3629, South Africa
Postal Address:	As above
Telephone:	+27 11 361 1398
Fax:	N/A
Email:	Patricia.nathaniel@wsp.co.za
EAP Qualifications:	BSc (Hons) Geography and Environmental Management
EAPASA Registration Number:	EAPASA (2020/1120)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.4.5 SPECIALISTS

Specialist input was required in support of this application for EA. The details of the specialists are provided in

Table 1-4 below. The specialists studies are attached in **Appendix G** and their declarations in **Appendix C**.

Table 1-4 – Details of Specialists

Assessment	Name of Specialist	Company	Sections in Report	Specialist Report attached as
Air Quality Impact Assessment	Nicole Singh Natasha Shackleton	WSP Group Africa (Pty) Ltd	▪ Section 2.7 ▪ Section 6.2 ▪ Section 8.1 ▪ Section 8.6.1 ▪ Section 9.2.1 ▪ Section 9.3.1	**Appendix G.1**
Traffic Impact Assessment	Carlos Alberto Vaz Esteves	NAKO SYSTRA (Pty) Ltd	▪ Section 2.7 ▪ Section 6.4 ▪ Section 8.8 ▪ Section 9.2.2 ▪ Section 9.3.2	**Appendix G.2**
Major Hazard Installation Assessment	Jacquine Andrews	ISHECON	▪ Section 2.7 ▪ Section 6.5 ▪ Section 8.5 ▪ Section 8.6.2 ▪ Section 9.2.3 ▪ Section 9.3.3	**Appendix G.3**

1.5 BASIC ASSESSMENT TERMS OF REFERENCE

According to the National Environmental Management Act (107 of 1998) (NEMA) EIA Regulations, 2014 as amended (GNR 326) hereafter referred to as the EIA Regulations, the Proposed Project must be subjected to a BA Process as it triggers activities contained in Listing Notice 1 (GNR 237).

As defined in Appendix 1 of the EIA Regulations, the objective of the basic assessment process is to, through a consultative process:

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
    - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    - (ii) the degree to which these impacts—
        - (aa) can be reversed;
        - (bb) may cause irreplaceable loss of resources; and
        - (cc) can be avoided, managed or mitigated; and
- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to:
    - (i) identify and motivate a preferred site, activity and technology alternative;
    - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
    - (iii) identify residual risks that need to be managed and monitored.

Public participation is a requirement of the BA Process; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the BA decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and

To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

1.6 BASIC ASSESSMENT REPORT STRUCTURE

As per the EIA Regulations 2014, as amended, Appendix 1 of Government Notice Regulation (GNR) 326 identifies the legislated requirements that must be contained within a Basic Assessment Report (BAR) for CA to consider and come to a decision on the application. **Table 1-5** below details where the required information is located within the draft BAR (this report).

Table 1-5 - Legal Requirements as detailed in Appendix 1 of GNR 326 of the 2014 EIA Regulations, as amended

Appendix 1 of GNR 326	Description	Relevant Report Section
3(1) (a)	Details of the EAP who prepared the report and the expertise of the EAP, including a curriculum vitae	Section 1.4.4 and **Appendix A**
3(1) (b)	The location of the activity	Section 3.1
3(1) (c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Section 3.1 and Section 3.3
3(1) (d)	A description of the scope of the proposed activity	Section 3.3 and Section 3.4
3(1) (e)	A description of the policy and legislative context within which the development is proposed	Section 5
3(1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 3.5
3(1) (g)	A motivation for the preferred site, activity and technology alternative	Section 4
3(1) (h)	A full description of the process followed to reach the proposed alternative within the site	Section 4
3(1) (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity	Section 4
3(1) (j)	An assessment of each identified potentially significant impact and risk	Section 8
3(1) (k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	Section 6 and Section 8
3(1) (l)	An environmental impact statement	Section 9

Appendix 1 of GNR 326	Description	Relevant Report Section
3(1) (m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr).	Section 9.3
3(1) (n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	Section 9.3
3(1) (o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 2.7
3(1) (p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section 10
3(1) (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be conducted, and the post construction monitoring requirements finalised	Section 10
3(1) (r)	An undertaking under oath or affirmation by the EAP	**Appendix B**
3(1) (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
3(1) (t)	Any specific information that may be required by the competent authority	N/A
3(1) (u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act	N/A

2

BASIC ASSESSMENT PROCESS

2 BASIC ASSESSMENT PROCESS

2.1 OBJECTIVES OF THE BASIC ASSESSMENT PROCESS AS PER THE PROCEDURAL FRAMEWORK

As defined in Appendix 1 of the EIA Regulations, 2014 (as amended), published under Government Notice No. R326 (as amended) (referred to as the EIA Regulations), the objective of the impact assessment process is to, through a consultative process:

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives;
- Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
    - The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    - The degree to which these impacts—
        - Can be reversed;
        - May cause irreplaceable loss of resources; and
        - Can be avoided, managed, or mitigated.
- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to–
    - Identify and motivate a preferred site, activity and technology alternative;
    - Identify suitable measures to avoid, manage or mitigate identified impacts; and
    - Identify residual risks that need to be managed and monitored.

2.2 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

DFFE has developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). *The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN 960 of July 2019)* states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R326 (as amended) in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed FFS TT Facility Expansion was generated on 23 September 2022 and is attached as **Appendix F**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the BA Process based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 2-1 below provides a summary of the sensitivities identified for the development footprint.

Table 2-1 – Sensitivities identified in the DFFE Screening Report

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme			X	
Palaeontology Theme				X
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report as determined by the screening tool:

- Agricultural Impact Assessment;
- Landscape/Visual Impact Assessment;
- Archaeological and Cultural Heritage Impact Assessment ;
- Palaeontology Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Hydrology Assessment;
- Noise Impact Assessment;
- Traffic Impact Assessment;

- Health Impact Assessment;
- Socio-Economic Assessment;
- Ambient Air Quality Impact Assessment;
- Air Quality Impact Assessment;
- Plant Species Assessment; and
- Animal Species Assessment.

2.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that "it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation."

The specialist studies required for the Proposed Project, as identified by the DFFE Screening Tool are included in **Table 2-2**. The table also identifies the specialist studies commissioned, motivation for specialist studies not commissioned and additional studies required.

Table 2-2 - Specialist Studies identified by the DFFE Screening Tool

Specialist Study Identified	Specialist Study Commissioned	Motivation
Agricultural Impact Assessment	No	▪ The current land-use of the proposed project is zoned as Harbour. The Proposed Project is situated in a highly disturbed and hard standing area, surrounded by other industrial harbour companies and activities. There is no potential for agricultural activities within the facility or surrounding areas due the disturbed nature of the area and current activities.
Landscape/Visual Impact Assessment	No	▪ The current land-use of the Proposed Project is zoned as Harbour. The facility is situated in a highly disturbed and hard standing area, surrounded by other industrial harbour companies and activities. The area and harbour has been transformed with minimal green areas, which only include grass patches along the road islands.
Archaeological and Cultural Heritage Impact Assessment	No	▪ The AMAFA and Research Institute had previously issued the facility with a permit in terms of Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 5 of 2018 (Permit Ref: 21/246), and graded the entire facility as not conservation worthy, however had provided permit conditions to be complied with, see **Appendix E**.
Palaeontological Impact Assessment	No	▪ The AMAFA and Research Institute had previously issued the facility with a permit in terms of Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 5 of 2018 (Permit Ref: 21/246), and graded the entire facility as not conservation

Specialist Study Identified	Specialist Study Commissioned	Motivation
		worthy, however had provided permit conditions to be complied with, see **Appendix E**.
Terrestrial Biodiversity and Avifaunal Impact Assessment (including Plant and Animal Species Theme)	No	▪ The Proposed Project is situated in a highly disturbed and hard standing area, surrounded by other industrial harbour companies with limited to no potential of sustaining a healthy indigenous terrestrial ecology.
Aquatic Biodiversity Compliance Statement	No	▪ The Proposed Project is located approximately 240m from the harbour berth, measured from the edge of the facility's boundary. The harbour berth area is currently utilised by various companies for loading and offloading of various products from cargo ships.
Hydrology Assessment	No	▪ The Proposed Project is currently situated on a hard standing surface, surrounded by roads and other harbour industries. The facility has existing stormwater management services, which will be updated to include the additional storage tank area and ancillary infrastructure. Stormwater from the facility will drain into the municipal system.
Noise Impact Assessment	No	▪ Noise emanating from the Proposed Project will predominantly originate from construction activities, and mitigation of which will be included in **Section 8** of this report and the EMPr (**Appendix H**). There are no anticipated noise impacts occurring during the operation of the proposed expanded facility.
Traffic Impact Assessment	Yes	▪ A Traffic Impact Assessment was conducted in 2015 by ILISO Consulting, commissioned by the CSIR and formed part of the Phase 1 BAR for the construction and operation of the existing FFS TT tank facility. Both construction and operation phases predicted a low significance of impact. ▪ An update to the TIA for Phase II has been conducted by NAKO SYSTRA (Pty) Ltd to assess potential impacts between 2023 and 2028.
Health Impact Assessment	No	▪ Aspects pertaining to Health and Safety will be covered in the Major Hazardous Installation Assessment commissioned for the Proposed Project.
Socio-Economic Assessment	No	▪ There will be limited socio-economic impacts and benefits from the Proposed Project due to the

Specialist Study Identified	Specialist Study Commissioned	Motivation
		small scale of the project and minimal persons required for operation of the facility.
Ambient Air Quality and Air Quality Impact Assessment	Yes	▪ An Air Impact Report was conducted to assess potential emission from the construction and operation of the Proposed Project (**Appendix G.1**).
Additional Studies		
Major Hazard Installation (MHI) Assessment	Yes	▪ Due to the proposed inclusion of new product storage at the location of the Proposed Project as identified by the MHI Regulations, an MHI study was conducted to assess potential impacts.

The above specialist studies commissioned were presented to the KZN EDTEA during the pre-application meeting that was held with on 22 November 2022. The specialist studies commissioned were accepted by the EDTEA as per the meeting minutes included in the SER in **Appendix D**.

The assessment protocols followed as well as the site sensitivity verification undertaken by the EAP are indicated in **Section 7**.

2.3 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of a pre-application consultation with KZN EDTEA and subsequently completing the appropriate application form as well as the submission and registration of the application for EA with the EDTEA. The pre-application meeting was held with EDTEA on 22 November 2022 (meeting minutes included in the Stakeholder Engagement Report (SER) in **Appendix D**). The application form will be submitted to EDTEA with the Draft BAR. An application reference number will be included in the Final BAR following acknowledgment of receipt from EDTEA.

2.4 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the environmental attributes of the Project area was compiled through a combination of desktop reviews and site investigations. Desktop reviews made use of available information including existing reports, aerial imagery, and mapping.

2.5 IMPACT ASSESSMENT METHODOLOGY

2.5.1 ASSESSMENT OF IMPACTS AND MITIGATION

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct[1], indirect[2], secondary[3] as well as cumulative[4] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[5] presented in **Table 2-3.**

Table 2-3 – Impact Assessment Criterion and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental	Improbable	Low Probability	Probable	Highly Probability	Definite

[1] Impacts that arise directly from activities that form an integral part of the Project.
[2] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[3] Secondary or induced impacts caused by a change in the Project environment.
[4] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[5] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
management measures or mitigation					
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**
Environmental Significance Rating (Positive (+))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

2.5.2 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Table 2-3** below.

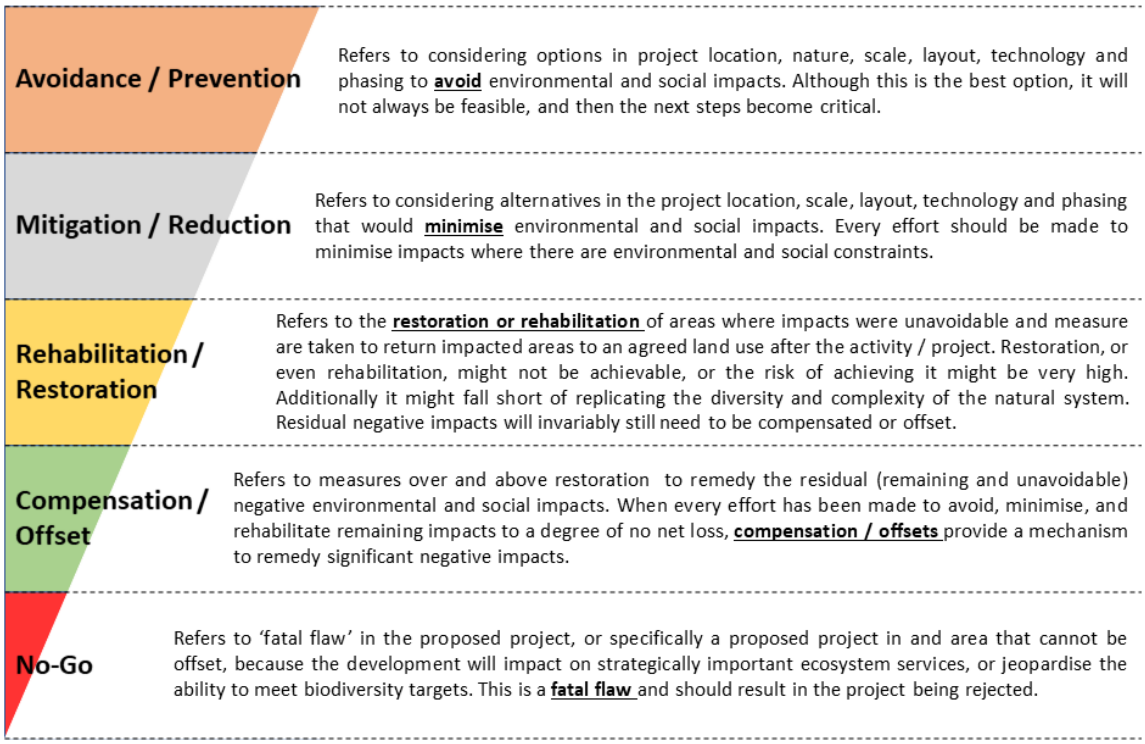


Figure 2-1 - Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

2.6 STAKEHOLDER ENGAGEMENT PROCESS

Stakeholder engagement, also known as the Public Participation Process (PPP) comprises a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the BA process. Effective stakeholder engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project.

The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the Proposed Project, including the scale and nature of the existing and proposed activities;

- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues and solutions.

The approach to stakeholder engagement is based on the following principles:

- Undertake meaningful and timely participation with stakeholders;
- Focus on important issues during the process;
- Undertake due consideration of alternatives;
- Take accountability for information used;
- Encourage co-regulation, shared responsibility and a sense of ownership over the proposed Project lifecycle;
- Apply "due process" particularly with regard to public participation as provided for in the EIA Regulations; and
- Consider the needs, interests and values of stakeholders.

The Public Participation guideline in terms of the NEMA EIA Regulations, drafted by the Department of Environmental Affairs (DEA) (now DFFE) in 2017, tabulates the level of Public Participation required for various levels of anticipated project impacts. This table has been used to identify additional Public Participation methods which are required for the Project. Highlighted cells (red) indicate the applicable response to the anticipated impacts. Results of the process are shown in **Table 2-4**.

Table 2-4 – Level of Public Participation as per Public Participation Guideline (DEA, 2017)

Scale of Anticipated Impacts	Recommended Response	
	If "Yes"	If "No"
Are the impacts of the project likely to extend beyond the boundaries of the local municipality?	Formal Consultation with other affected municipalities should be carried out during the PPP.	No need to have a formal consultation with other municipalities during PPP. Minimum requirements for public participation in accordance with EIA must be met.
Are the impacts of the project likely to extend beyond the boundaries of the province?	Formal Consultation with other affected provinces should be carried out during the PPP.	No need to have a formal consultation with other provinces during PPP. Minimum requirements for public participation in accordance with EIA must be met.

Scale of Anticipated Impacts	Recommended Response	
	If "Yes"	If "No"
Is the project a greenfields development (a new development in a previously undisturbed area)?	Extensive consultation with Registered Interested and Affected Parties (RI&APs) might be required before a decision is taken on the project to in order to gather more information, and to ensure that there is minimal impact on the environment.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Does the area already suffer from socio-economic problems (e.g. job losses) or environmental problems (e.g. pollution), and is the project likely to exacerbate these?	Extensive consultation with RI&APs within the area should be undertaken, to gather more information on both the socio-economic and environmental problems.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Is the project expected to have a wide variety of impacts (e.g. socio-economic and ecological)?	Thorough consultation needs to be conducted with RI&APs, in order to address variety of impacts.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Public and environmental sensitivity of the project:		
Are there widespread public concerns about the potential negative impacts of the project?	Broader consultation with all RI&APs will need to be undertaken.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Is there a high degree of conflict among RI&APs?	There might need to be more consultation to ensure that there is consensus reached among RI&APs.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Will the project impact on private land other than that of the applicant?	Consultation with the private landowner must be done, and all their concerns need to be addressed.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Does the project have the potential to create unrealistic expectations (e.g. that a new factory would create a large number of jobs)?	Thorough consultation that addresses the perceptions of unrealistic expectations needs to be carried out.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Potentially affected parties:		

Scale of Anticipated Impacts	Recommended Response	
	If "Yes"	If "No"
Has very little previous public participation taken place in the area?	More thorough public participation should take place within the area, to ensure that all potential and RI&APs participate.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Did previous public participation processes in the area result in conflict?	Additional consultation might be needed to ensure that issues of conflict are addressed effectively.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Are there existing organisational structures (e.g. local forums) that can represent I&APs?	Organizational structures might minimise conflict whilst maximising the participation.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Is the area characterised by high social diversity (i.t.o. socio-economic status, language or culture)	Proper consultations that address language and cultural diversity should be promoted.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Were people in the area victims of unfair expropriations or relocation in the past?	PPP should be extensive and address any unfair practices that occurred in the past.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Is there a high level of unemployment in the area?	The PPP should ensure that there are no unrealistic expectations created due to the project. The consultation should ensure that any unrealistic expectations are adequately addressed before the project starts.	Minimum requirements for public participation in accordance with EIA Regulations must be met.
Do the RI&APs have special needs (e.g. a lack of skills to read or write, disability, etc)?	Consultation should include mechanisms that will ensure full participation by people with special needs.	Minimum requirements for public participation in accordance with EIA Regulations must be met. Minimum requirements for PP in accordance with the Act must be met as well as best practices relating to PP.

An SER has been included in **Appendix D** and will be updated in the final BAR, detailing the project's compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

2.6.1 INTERESTED AND AFFECTED PARTIES

An Interested and Affected Party (I&AP) is defined as any person, group of persons or organisations interested in or affected by an activity, and any organ of state that may have jurisdiction over any aspect of the activity.

- The difference between an I&AP and a registered I&AP:
  - An I&AP can be directly or indirectly impacted on by a proposed activity.

- A registered I&AP is a person whose name has been placed on the register of registered I&APs. According to the PPP Guidance document, 2017, only registered I&APs will be notified:
  - Of the availability of reports and other written submissions made to the Competent Authority (CA) by the Applicant; and
  - Of the outcome of the application, the reasons for the decision, and that an appeal may be lodged against a decision.

For the purpose of this report, registered I&APs will be referred to as Stakeholders.

2.6.2 RIGHTS, ROLES AND RESPONSIBILITIES OF THE STAKEHOLDER

In terms of Chapter 6, specifically Section 43(1) of the NEMA EIA Regulations 2014, as amended, registered stakeholders have the right to bring to the attention of the CA any issues that they believe may be of significance to the consideration of the application. The rights of stakeholder are qualified by certain obligations, namely:

- Stakeholders must ensure that their comments are submitted within the timeframes that have been approved by KZN EDTEA, or within any extension of a timeframe agreed by the Proponent, EAP or CA;
- Disclose to the EAP any direct business, financial, personal or other interest that they might have in the approval or refusal of the application;

The roles of stakeholders in a public participation process usually include one or more of the following:

- Assisting in the identification and prioritisation of issues that need to be investigated;
- Making suggestions on alternatives and means of preventing, minimising and managing negative impacts and enhancing proposed project benefits;
- Assisting in or commenting on the development of mutually acceptable criteria for the evaluation of decision options;
- Contributing information on public needs, values and expectations;
- Contributing local and traditional knowledge; and
- Verifying that their issues have been considered.

In order to participate effectively, stakeholders should:

- Become involved in the process as early as possible;
- Register as a stakeholder;
- Advise the EAP of other stakeholders who should be consulted;
- Contribute towards the design of the public participation process (including timeframes) to ensure that it is acceptable to all stakeholders;
- Follow the process once it has been concluded;
- Read the material provided and actively seek to understand the issues involved;
- Give timeous responses to correspondence;
- Be respectful and courteous towards other stakeholders;
- Refrain from making subjective, unfounded or ill-informed statements; and
- Recognise that the process is confined to issues that are directly relevant to the application.

2.6.3 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;
- Placement of community notices;
- Completed comment sheets;

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

Section 41 of the 2014 EIA Regulations, as amended states that written notices must be given to identified stakeholders as outlined in **Table 2-5** below.

Relevant authorities (Organs of State) have been automatically registered as I&APs. In accordance with the EIA Regulations, 2014 (as amended), all other persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders and included in future communication regarding the project.

Table 2-5 – Interested and Affected Parties

NEMA Requirement	Discussion
(i) the owner or person in control of that land if the applicant is not the owner or person in control of the land	The Proposed Project is located on a portion of land owned by Transnet National Port Authority (TNPA). TNPA have been included in the stakeholder database. The land portion associated with the Proposed Project: ■ Portion 1 of ERF 10019
(ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken	The Proposed Project will entail development within the existing premises leased by the project company. All surrounding occupiers have been included in the stakeholder database and will continue to be informed through the EA process. Site notices were placed within a 2 km radius of the Proposed Project on 05 May 2023. Adverts were placed in English and isiZulu in the Mercury and Isolezwe Newspapers respectively, on 14 April 2023. Due to the Protection of Personal Information Act (No. 4 of 2013) (POPI) it may not be possible to obtain contact details for all adjacent landowners.
(iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken	The Proposed Project will entail development within the existing premises leased by the project company. All surrounding occupiers have been included in the stakeholder database, and will continue to be informed through the EA process.

NEMA Requirement	Discussion
	Site notices were placed within a 2 km radius of the Proposed Project on 05 May 2023. Adverts were placed in English and isiZulu in the Mercury and Isolezwe Newspapers respectively, on 14 April 2023. Due to the Protection of Personal Information Act (No. 4 of 2013) (POPI) it may not be possible to obtain contact details for all adjacent landowners.
(iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area	Ward Councillor (Mzokuthoba Protas Mngonyama) of Ward 32 (eThekwini Local Municipality; Albert Park) has been included in the stakeholder database.
(v) the municipality which has jurisdiction in the area	The project is located in the eThekwini Local Municipality, and has been included in the stakeholder database. Notification was sent to Batha Msomi for distribution to the relevant line departments.
(vi) any organ of state having jurisdiction in respect of any aspect of the activity	The organs of state that have jurisdiction over the activity are EDTEA and the eThekwini Municipality (Development Planning, Environment and Management Unit). The EDTEA has been consulted as the CA regarding the EA application. These two organs of state were also provided written notification of the project via email.
(vii) any other party as required by the competent authority.	All tiers of government, namely, national, provincial, local government and parastatals have been included in the stakeholder database. Inclusive of: ▪ EDTEA: EIA unit; ▪ EDTEA: Coastal unit; ▪ Ezemvelo KZN Wildlife; ▪ KZN Amafa and Research Institute; ▪ KZN Department of Human Settlements, Water and Sanitation; ▪ KZN Department of Transport; ▪ KZN Department of Health; ▪ KZN Department of Employment and Labour; ▪ eThekwini Municipality; ▪ eThekwini: Air Quality. For a full list of registered stakeholders please refer to **Appendix D**.

A list of stakeholders captured in the project database is included in the SER in **Appendix D**.

2.6.4 NOTIFICATION OF POTENTIAL I&APS

2.6.4.1 Newspaper Advertisements

In accordance with the requirements of GNR 326, as amended, the proposed project was advertised in a local and regional newspaper (i.e. The Mercury (English) and Isolezwe (isiZulu)) on 14 April 2023. The purpose of the advertisement was to notify the public about the proposed project and to invite them to register as stakeholders (**Appendix D**).

Table 2-6 – Relevant newspapers and dates on which the adverts were published

Newspaper	Publication	Language
The Mercury	14 April 2023	English
Isolezwe	14 April 2023	English

Should the EAP identify an affected stakeholder and be made aware of his/her existence by the ward councillor, efforts will be made to ensure his/her participation in the stakeholder engagement process [as required by Section 41(2) (e) of Chapter 6].

2.6.4.2 Site Notices

Regulation 41 (2) (a) of the EIA Regulations (as amended) requires that site notices providing information on the project and EIA Process are fixed at places that are conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site. The following has been undertaken:

English and IsiZulu site notices were placed at the following locations on 02 May 2023:

Table 2-7 – Details of Site Notice Placement

Name	Area	Type of Establishment	Coordinates
FFS TT Main Entrance	Maydon Wharf	Project Company Premises	29°52'39.22"S 31° 0'7.57"E
FFS TT – Proposed New Tank Storage Facility	Maydon Wharf	Project Company Premises	29°52'38.60"S 31°0'10.92"E
SAPS Maydon Wharf	Maydon Wharf	South African Police Service	29°52'41.30"S 31° 0'6.47"E
Shell Petrol Station	Maydon Wharf	Petrol Station	29°52'29.68"S 31° 0'6.55"E

A copy of the site notice and proof of placement is included in **Appendix D**.

2.6.5 PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMNET REPORT

The Draft BA report will be made available to stakeholder as follows:

- WSP on request; and
- Online on the WSP website: (https://www.wsp.com/en-ZA/services/public-documents).

Hard copies and/or electronic copies of the report were provided to the relevant regulatory and local authorities for comment, including:

- EDTEA

2.6.6 COMMENT AND RESPONSE REPORT

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') will be documented and responded to adequately in a Comment and Response Report to be included in the Final BAR. The CRR records the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

2.6.7 SUBMISSION AND DECISION MAKING

All issues raised during the public review of the Draft BA report will be incorporated and addressed in the Final BA report submitted to EDTEA. The EDTEA is allocated 107 days to review the Final BA report as per 2014 EIA Regulations, as amended. Stakeholders will be notified of the Final BA report availability for further comment. Comments are to be submitted by stakeholders directly to EDTEA.

2.7 ASSUMPTIONS AND LIMITATIONS

2.7.1 GENERAL ASSUMPTIONS AND LIMITATIONS:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- A Site visit has been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the Pre-Application meeting and subsequent minutes, the CA would not require additional specialist input, in order to make a decision regarding the application.

2.7.2 AIR QUALITY IMPACT ASSESSMENT

The following assumptions were taken into consideration for emission calculations:

- Normal operating hours of 24 hours per day, seven days a week, was assumed and confirmed by FFS TT.
- Emission rates for bulk storage tanks were simulated using the USEPA TANKS 4.0.d emissions estimation model as recommended by the Modelling Regulations.
- Chemical databases already preloaded into the TANKS model was used to estimate emission rates for chemicals stored on site.
- Bitumen was simulated as Distillate fuel oil no 2 in the TANKS model. Bitumen has similar chemical properties (i.e. vapour pressure) and is the closest match to Distillate Fuel Oil No 2. This assumption is consistent with other specialist studies conducted for similar industries in South Africa.

- Heavy Fuel Oil (HFO) was simulated in TANKS as Residual Oil No 6, while illuminated Paraffin was simulated as Jet Kerosene. This assumption is consistent with other specialist studies conducted for similar industries in South Africa. Residual Oil No 6 has no speciated profile within the TANKs model due to the low detection level of BTEX within the chemical.
- All predicted VOC concentrations have been assumed to comprise 100% of C_6H_6 as a worst-case scenario (and in the absence of the VOC composition). Given the Benzene (C_6H_6) standard is the most stringent standard for VOCs, VOCs have thus been compared to the annual standard of C_6H_6.
- The tanks were modelled in AERMOD using parameters that are set with a gas exit velocity of 0.001 m/s and a diameter of 0.001 m, as per the Modelling Regulations.

Storage Tanks:

- Data input for the emissions inventory and dispersion model is based on the information provided by FFS TT. It is assumed that this information provided is accurate and complete at the time of modelling.
- Site specific modelled WRF meteorological data was used in the modelling assessment, which is assumed to be representative of conditions at the site.
- Normal operating hours of 24 hours per day, seven days a week, was assumed and confirmed by FFS TT.
- Emission rates for bulk storage tanks were simulated using the USEPA TANKS 4.0.d emissions estimation model as recommended by the Modelling Regulations.
- Chemical databases already preloaded into the TANKS model was used to estimate emission rates for chemicals stored on site.
- Bitumen was simulated as Distillate fuel oil no 2 in the TANKS model. This assumption is consistent with other specialist studies conducted for similar industries in South Africa.
- HFO was simulated in TANKS as Residual Oil No 6, while illuminated Paraffin was simulated as Jet Kerosene. This assumption is consistent with other specialist studies conducted for similar industries in South Africa. Residual Oil No 6 has no speciated profile within the TANK model, due to the low detection level of BTEX within the chemical.
- All predicted VOC concentrations have been assumed to comprise 100% of C_6H_6 as a worst case scenario (and in the absence of the VOC composition). Given that the C_6H_6 standard is the most stringent standard for VOCs, VOCs have thus been compared to the annual standard of C_6H_6.
- The tanks were modelled in AERMOD using parameters that are set with a gas exit velocity of 0.001 m/s and a diameter of 0.001 m, as per the Modelling Regulations.

Loading and Offloading

- A conservative approach, using maximum volume of product stored on site to estimate loading/offloading loss.
- The vapours displaced from the process vessels are assumed to be identical to the vapours from the materials being loaded.
- Five loading bays/gantries were assumed to be on site.

Small Fired Heaters

- Emissions rates for PM_{10}, $PM_{2.5}$, NO_2 and SO_2 were provided by FFS TT.
- Based on current information that FFS TT will not operate any boilers >10 MW heat input, the operation of heaters at FFS TT are unlikely to trigger Section 23 of NEM:AQA, Subcategory 2.1:

Combustion Installations of listed activities (e.g. small boilers, most applicable in this case). As such, at this stage, FFS TT is not required to conform to any emission standards and reporting stipulated by these regulations however they are required to register these fuel burning appliances with the municipality in order to operate them. Should this change during the course of the project, this will need to be reassessed and addressed accordingly.

2.7.3 TRAFFIC IMPACT ASSESSMENT

- The document "Manual for Traffic Impact Assessments and Site Traffic Assessment, Version 0.1, October 2015" (herein referred to as the Manual) published by the eThekwini Transport Authority (ETA) is silent for a petrochemical industrial land use such as a new liquid bulk fuel tank farm.
- The 24 hour volume was converted to a peak hour volume using the following assumptions :
  - 24 Hr : 12Hr conversion = 1.2
  - A heavy goods vehicle (HGV) analysis was undertaken at the intersections of Maydon Road Margaret Mncadi Avenue (intersection 1) and Maydon Road / Rick Turner Road / Shadwell Road (intersection 2). The HGV analyses showed that, as a worst-case scenario, the highest HGV percentage in an hour at intersections 1 and 2 were 13.7% and 11.4%, respectively. Thus, the higher percentage (13.7%) was used to convert the 12-Hour HGV trips to estimate the peak hour HGV trips.
  - Employing the abovementioned assumptions 7 HGV trips were estimated in the peak hour.
  - Using a passenger car unit (PCU) factor of 5, thus, the 7 HGV's equated to 35 PCU's.
- It was assumed that the heavy vehicles would enter / exit the development site in the same peak hour having a split 50% in : 50% out.
- The intersections that were considered most appropriate to analyse was limited to the following intersections:
  - Maydon Road with Margaret Mncadi Road (1),
  - Maydon Road with Rick Turner Road / Shadwell Road / Wisely Road (2),
  - Rick Turner road with Sydney Road (3), and
  - Rick Turner Road with Umbilo Road (4).

2.7.4 MAJOR HAZARD INSTALLATIONS

The following assumptions were used for the determination of the risk frequencies, which may impact the risk levels, should the actual operations differ significantly:

- MEG and DEG delivered by ship on average once per month with 3 MEG road tankers loaded per day and one DEG on average, taking 30 minutes to fill the tanker.
- HFO / RFO delivered by ship once per month with 3 road tankers loaded per day from storage tanks, taking 45 minutes per taking.
- Bitumen is loaded into road tankers 60 times per week on average. The largest tanker on site is 35 tonnes.
- Base oil is loaded into road tankers 5 times per week on average.
- Paraffin storage refilled once per month.
- Emergency equipment in the form of fire alarms, fire extinguishers and at least fire hose reels are available.
- The emergency procedures are sufficient and have been practiced.
- Personnel and installation owners are suitably trained and aware of potential MHI events.

- Vessels on existing and proposed sites have interconnected bunds which mitigates the overfilling hazard.
- The majority of the aboveground pipe rack runs along the southern boundary of the existing site.
- All piping used for hazardous material transfer are maintained as per statutory requirements.
- Tankers and loading hoses / pipes are maintained as per statutory requirements.
- It was assumed that storage tanks for the bitumen and base oils will be interconnected with level indication and high-level alarms to prevent overfilling.
- It was assumed that the aboveground pipe rack with the transfer pipe from the berth is located above-ground only within the FFS Tank Terminals site boundary.

The assumptions above contribute to the uncertainty of the risk assessment, as these elements can change in time, changing the risk.

In terms of sensitivities, the defined weather and surface type parameters have a significant influence on the risk contours generated.

Population – the number of people on the site and the development of property around the site may change over time and may have a significant influence on the societal risk of the installation.

- The specific Process Safety Management measures in place and in operation on the different plots may not be identical and could carry varying degrees of risks.
- It was assumed that storage tanks for the bitumen and base oils will be interconnected with level indication and high-level alarms to prevent overfilling.
- It was assumed that the aboveground pipe rack with the transfer pipe from the berth is located above-ground only within the FFS Tank Terminals site boundary.

3

PROJECT DESCRIPTION

3 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the site location alternatives considered for the project. The descriptions encompass the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326, as amended.

3.1 LOCATION OF THE PROPOSED PROJECT

The FFS TT Tank Storage Facility is located within Maydon Wharf, Durban Harbour, in the eThekwini Local Municipality, KwaZulu-Natal (**Figure 1-1**).

The expansion of the tank storage will be conducted within the existing footprint of the FFS TT facility, and will include various sized storage tanks, pumps, loading gantries and piping. The proposed development layout of the FFS TT Tank Expansion Facility is illustrated in **Figure 3-1**.

The details of the property associated with the proposed tank facility expansion, including the 21-digit Surveyor General (SG) codes for the cadastral land parcel is outlined in **Table 3-1**. The co-ordinates of the cadastral land parcel is included in **Table 3-2** below.

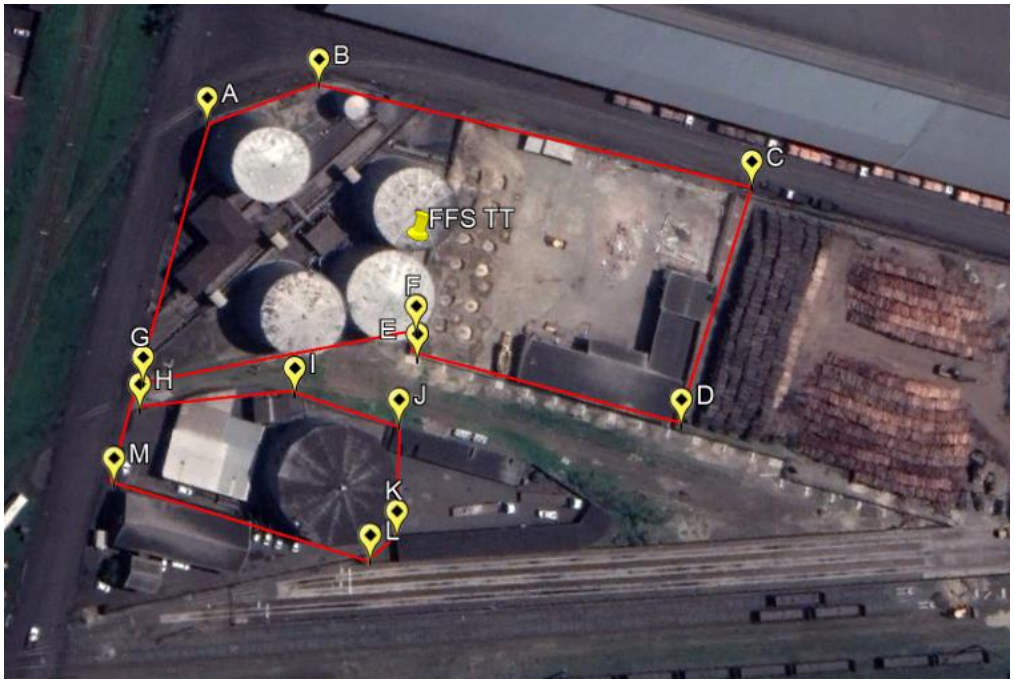
Table 3-1 – FFS TT Property Details

Property Description	
Province	KwaZulu-Natal
District Municipality	eThekwini Metropolitan Municipality
Local Municipality	eThekwini Metropolitan Municipality
Ward Number	Ward 32
Portion Number	Portion 1 of ERF 10019, Durban
SG Code	N0FU00850001001900001

Table 3-2 – Coordinate Points of the Cadastral Land Parcel

Map Label	Latitude	Longitude	Map Label	Latitude	Longitude
A	29°52'38.16"S	31° 0'7.75"E	**H**	29°52'40.62"S	31° 0'6.78"E
B	29°52'37.93"S	31° 0'8.93"E	**I**	29°52'40.65"S	31° 0'8.33"E
C	29°52'39.34"S	31° 0'13.16"E	**J**	29°52'41.03"S	31° 0'9.32"E
D	29°52'41.34"S	31° 0'12.09"E	**K**	29°52'41.98"S	31° 0'9.16"E
E	29°52'40.49"S	31° 0'9.58"E	**L**	29°52'42.15"S	31° 0'8.87"E

F	29°52'40.25"S	31° 0'9.60"E	**M**	29°52'41.22"S	31° 0'6.46"E
G	29°52'40.39"S	31° 0'6.84"E			



The existing property footprint is approximately 12 415 m^2, whilst the proposed expansion area is estimated at 6 025 m^2. The site will be accessed via Johnstone and Fletcher Roads.

The Project is located in a developed, transformed area that is designated for industrial activity. Principal areas of activity surrounding the Project include:

- Wood chip warehouse adjacent to the north, across Fletcher Road;
- Industries mainly related to freight handling and storage, shipping and engineering;
- Maydon Wharf Police Station, and railway tracks adjacent to the south of the site;
- Industrial companies approximately within a 1,2 km radius (e.g. Unilever to the north, Gardner Smith to the south and the Sugar Terminal to the north);
- Harbour and bay area adjacent on the south side;
- M4 Highway, 400 m northeast;
- Glenwood residential area 1,4 km northwest;
- Umbilo residential area 2,3 km west;
- Clairwood residential area 4,3 km south;
- Railway staging area 2,3 km south;
- The Indian Ocean and beach 4 km north east

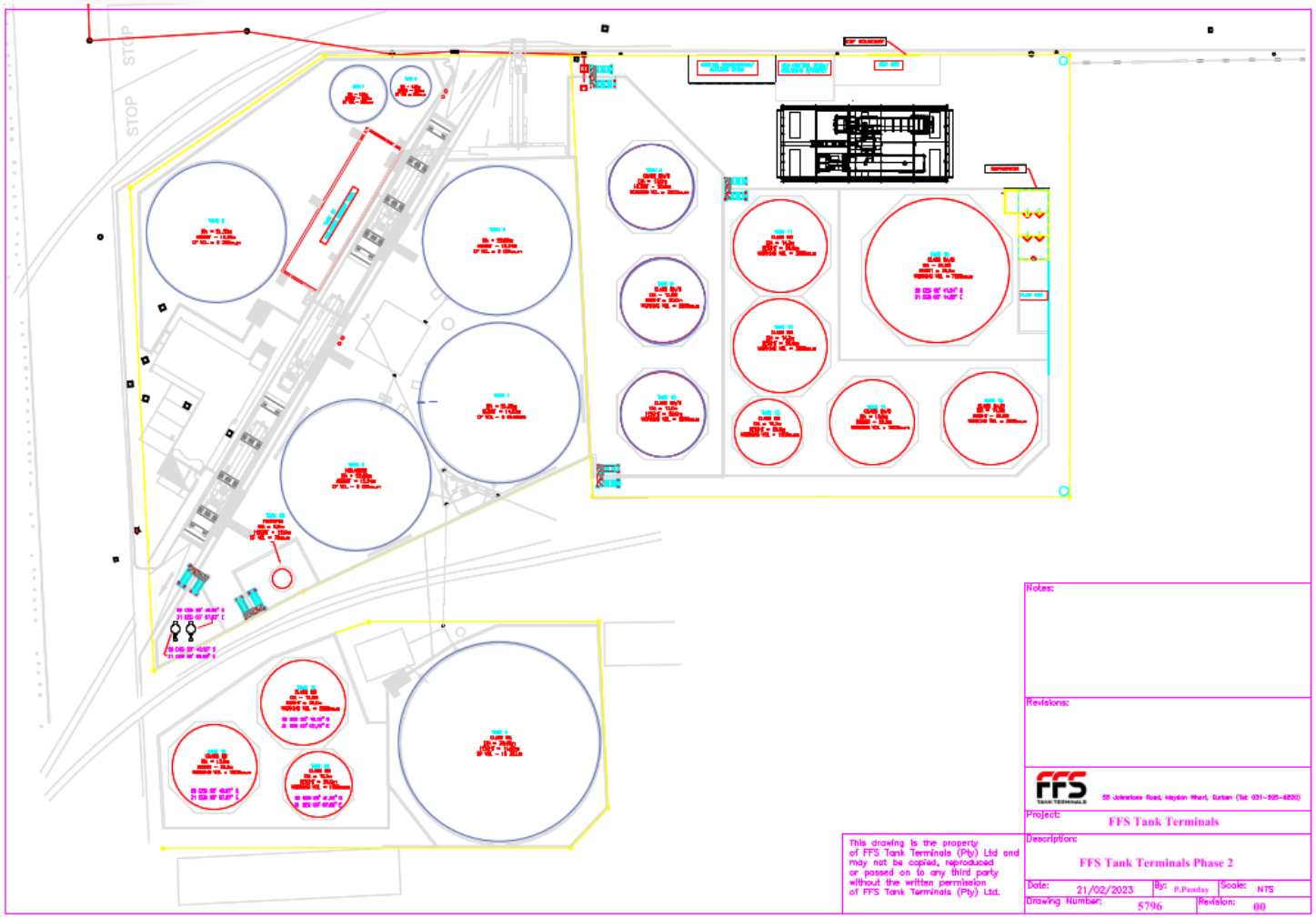


Figure 3-1 – FFS TT Project Layout (New tanks indicated with red circles)

3.2 FFS TT TANK STORAGE FACILITY DESCRIPTION

The FFS TT tank storage facility is located in Maydon Wharf, Durban Harbour, with eight (8) storage tanks currently in operation.

The facility operates by receiving product via ship, this is pumped using dedicated pipelines designed specifically for the product being received from berths 8 and 9 at Maydon Wharf, **Figure 3-2** below. The product is then stored in the designated tanks, and offloaded via the gantries into logistic tankers for shipment to the client. This is an ongoing operation and pumping and storage activities are conducted based on client requirements. The facility also has capabilities of receiving product via road vehicle (Road Tankers).

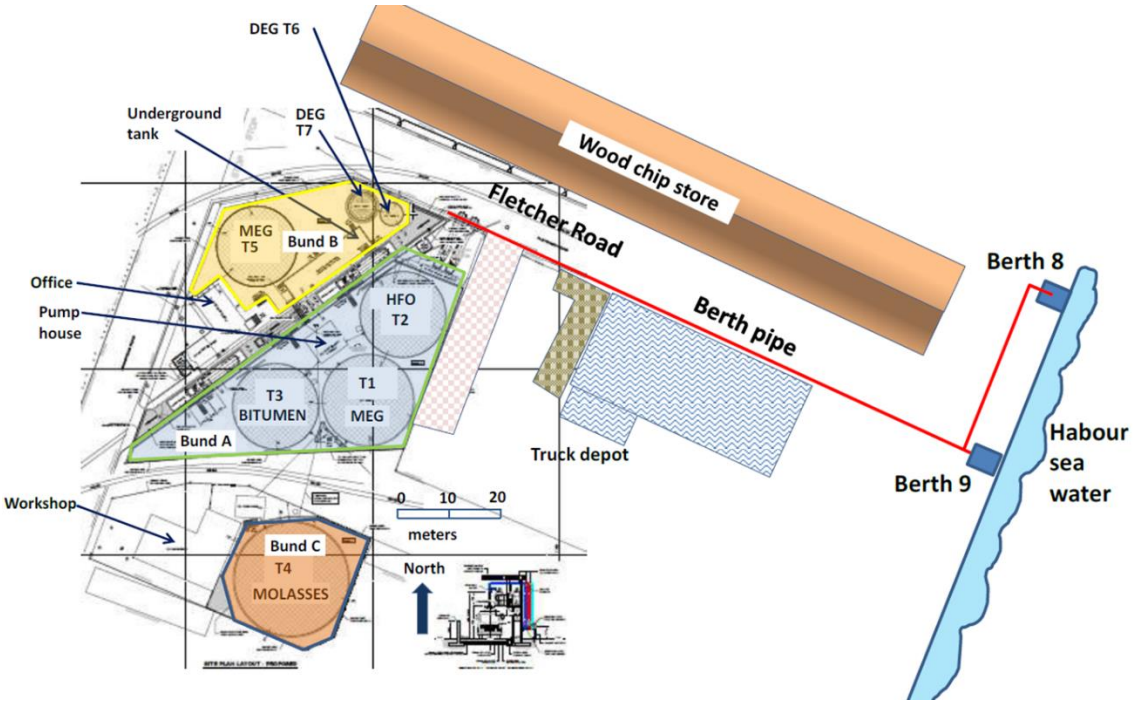


Figure 3-2 - Facility connection to berths 8 and 9.

3.3 PROJECT INFRASTRUCTURE

The proposed FFS TT Tank Storage Facility includes the following components:

- Tank Storage;
- Piping;
- Pump Houses;
- Loading Gantry and Weighbridges;
- Illuminating Paraffin Heaters;
- Other related Infrastructure.

These items are discussed in more detail below.

3.3.1 TANK STORAGE

There are currently seven (7) aboveground storage tanks (AST's) and one (1) underground storage tank (UST) in operation at the FFS TT facility. Molasses, vegetable oils, bitumen, HFO, DEG and MEG are currently being stored and handled at the facility.

FFS TT proposes to expand the storage capacity by constructing an additional ten (10) tanks of varying sizes within the existing footprint of its current operations. The new tanks will store a range of Residual Oil No 6 products such as Base Oil, Slack Wax, Bitumen and Heavy Fuel Oil, as well as Jet Kerosene (illuminated paraffin (for heaters)) and biodiesel. Additional 80 m^3 of Illuminating Paraffin will also be stored within the facility to provide fuel to the proposed new heaters.

The existing and proposed AST's are enclosed vertical steel tanks (which will comply with SANS 10089), With steel coned roofs tanks constructed to the API 653 code for welded tanks for Oil Storage. Material specification as per ASME II 2021 and Non-Destructive examination as per ASME V 2021.

Table 3-3 Provides details on the dimensions of the existing and proposed storage tanks, including the proposed products that may be stored in the designated tanks located at the facility. The stored products in the tanks may be switched, based on the facility's client requirements.

Table 3-3 – Storage tank specifications and related products

Tank ID	Products	Tank Type	Tank Heating	Tank Height (m)	Maximum Liquid Height (m)	Tank Diameter (m)	Maximum Capacity (m^3)	Working[6] Volume (m^3)
Existing Tanks								
Tank 1	MEG/Base Oil/Vegetable Oil/Molasses	AST	No	14.63	14.23	24.83	6 830	6 643
Tank 2	MEG/Base Oil/Vegetable Oil/Molasses/HFO	AST	No	15.24	14.84	22.86	6 255	6 091
Tank 3	HFO/MEG/Base oil/Vegetable oil/Molasses/Biodiesel	AST	No	15.24	14.84	22.86	6 255	6 091
Tank 4	HFO/Molasses/Vegetable Oil/Base Oil	AST	Yes	14.63	14.23	30.48	10 675	10 383
Tank 5	HFO/Vegetable Oil/Base Oil/Molasses	AST	Yes	18.29	17.89	21.33	6 536	6 393
Tank 6	MEG/DEG/Vegetable Oil/Molasses	AST	No	9.60	9.20	6.00	271	260
Tank 7	MEG/DEG/Vegetable Oil/Molasses	AST	No	9.60	9.20	7.30	402	385

[6] Maximum volume of liquid product that will be stored in the tank.

Tank 8	Bitumen/HFO	AST	Yes	20.00	19.00	13.00	2 655	2 522
Tank 9	Bitumen/HFO	AST	Yes	20.00	19.00	13.00	2 655	2 522
Tank 10	Bitumen/HFO	AST	Yes	20.00	19.00	13.00	2 655	2 522
Tank 21	Fire Water/Molasses/MEG&DEG	UST	No	23.00	2.44	6.00	336	69
New Tanks								
Tank 11	Bitumen	AST	Yes	20.00	19.00	14.30	3 212	3 052
Tank 12	Bitumen	AST	Yes	20.00	19.00	14.30	3 212	3 052
Tank 13	Bitumen	AST	Yes	20.00	19.00	10.20	1 634	1 553
Tank 14	Bitumen/HFO	AST	Yes	20.00	19.00	13.00	2 655	2 522
Tank 15	Bitumen/HFO	AST	Yes	20.00	19.00	14.30	3 212	3 052
Tank 16	HFO/Base Oil/Veg Oil	AST	Yes	20.00	19.00	22.00	7 603	7 223
Tank 17	Base Oil/Vegetable oil/Biodiesel/Slack Wax	AST	No	20.00	19.00	13.00	2 655	2 522
Tank 18	Base Oil/Vegetable oil/Biodiesel/Slack Wax	AST	No	20.00	19.00	13.00	2 655	2 522
Tank 19	Base Oil/Vegetable oil/Biodiesel/Slack Wax	AST	No	20.00	19.00	10.20	1 634	1 553

Tank 20	Illuminated Paraffin	AST	No	12.00	11.40	2.90	80	75

HFO, heated Bitumen, Slack Wax and illuminating Paraffin are classified as dangerous goods, as per SANS 10234. The total storage volume of the facility will increase from **37 559 m^3** to **74 075 m^3**, of which a total of **66 236 m^3** is designated for the storage of dangerous goods (assuming that all the bitumen to be stored will be heated as heating of Bitumen classifies it as a dangerous good).

3.3.2 BERTHS AND PIPING

There are currently two (2) existing underground pipelines that supply the facility with product from Maydon Wharf berths 8 and 9, approximately 300 - 400 mm in diameter and 300 m in length. The pipelines supply Molasses (stainless steel pipeline), DEG and MEG (High Density Polyethylene (HDPE) piggable pipeline). Vegetable Oil is also supplied using these pipelines.

FFS TT proposed to construct and operate six (6) aboveground stainless/mild steel pipelines, under their previous environmental authorisation, approximately 300 mm diameter and 300 m in length for the supply of Residual Oil No 6 such as Base Oil, Bitumen and HFO to the facility, from Maydon Wharf berths 8 and 9.

Two new pipelines are required for authorisation under this environmental assessment with the same dimensions.

3.3.3 PUMP HOUSES

The facility currently operates six (6) centrifugal pumps for the pumping of Molasses, MEG and DEG.

Three (3) centrifugal pumps are used for pumping MEG and DEG:

- Tanks 5 & 1 individual pump at each tank;
- Tanks 6 & 7 sharing 1 pump;
- Pumps are equipped with a stop & start switch at each gantry.

Two (2) Pump Houses utilised for the pumping of Molasses:

- Pump House 1 with 2 pumps used simultaneously, attached to tanks 2 & 3.
- Pump house 2 with 1 pump attached tank 4.
- Molasses pumps are equipped with a reverse and forward switch which can transfer product from or into the storage tank.
- Pumps are equipped with a stop & start switch at each gantry.
- Pump house 2 pump is not connected to any gantries and requires manual switching.
- Bypass valves are used to control the flow of the product.

An additional pump house will be constructed, and will house six (6) pumps for the supply of product to the additional storage tanks.

3.3.4 LOADING GANRTY AND WEIGHBRIDGES

There are currently three (3) Loading Gantries equipped with:

- 3 x Dedicated loading lines for Molasses, HFO, MEG & DEG on each gantry;
- 2 x weigh bridges at gantries 1 & 3.

Two (2) additional loading gantries are proposed to be constructed with two weighbridges to facilitate the loading of the additional product.

3.3.5 ILLUMINATING PARAFFIN HEATERS

Two proposed illuminating Paraffin heaters will be installed within the facility, utilising the 80m^3 illuminating Paraffin tank for fuel supply. Each heater is rated at 2 060 kW, and will be required for the heating of Bitumen and HFO proposed to be stored in the additional tanks.

3.3.6 OTHER INFRASTRUCTURE

The area that will house ten (10) new tanks had previously housed a 3-storey office block (450 m^2), single storey office block (200 m^2), sheds (295 m^2), four carports and portion of warehousing (1 300 m^2), and was removed during 2022. A stores/workshop and changeroom, dining and ablution block is still to be removed in order to provide space for the proposed new expansion.

Bunds around the 3 x 2 500 m^3 tanks (8-10) are shared with the existing tanks (1-2 and 5). Tank 20 will have its own bund within the larger bund. Tanks (11-15) will share a bund, and Tank 16 will have its own bunding. All bunding will comply with SANS 10089.

Additional buildings will include:

- Control room;
- Ablution facility;
- Main control centre.

There is currently an existing ESKOM transformer/metering room will remain in location.

3.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

3.4.1 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 3-4**.

Table 3-4 – Construction activities

Activity	Description
Establishment and access	Access to the facility will be via the Johnstone and Fletcher Roads, which are tarred and marked and maintained by the eThekwini Municipality. There is currently access to an existing locked gate on Fletcher Road which will be utilised for contractors to access the development area. Contractors will set up the camps within the property of FFS TT.
Site preparation and establishment	Site establishment will include the demolition of specific existing buildings and concrete padding, removal of underground infrastructure (stormwater and sewer lines) and preparation of the ground for foundation works.
Transport of components and equipment to site	All construction material (piping, tanks and concrete), machinery and equipment (i.e., excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Large components (such as tank structures) may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.
Establishment of a laydown area on site	Construction materials, machinery and equipment will be kept in a locked, security-controlled area within the facilities' property, off Fletcher Road. The laydown area will also be utilised for contractors' office spaces and pre-assembly of tank and piping infrastructure. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
Foundation works	The site area will be prepared and compacted per design. Concrete will be poured at various areas for infrastructure foundation and bunding. The

Activity	Description
	foundation of the tanks will require piling, and drill rigs will be utilised for these activities.
Erection of tanks	The steel tanks will arrive to site in pieces, and will be lifted and welded/bolted into place. Cranes will be utilised for the erection of the tank structures.
Establishment of ancillary infrastructure	Ancillary infrastructure will include a workshop, storage areas, office and materials container, and a temporary laydown area for contractor's.
Completion of construction	Once all construction is completed on site, all equipment and machinery will be removed from site. Note that construction will take place on a site that is already hard surfaced thereby limiting environmental impacts.

3.4.2 OPERATIONAL PHASE

During operation, the key activities will include loading and offloading of tankers, offloading of product from ships from Berth 8 & 9; inspection and maintenance of the storage tanks, piping, pumps, bunded areas, weighbridges, paraffin fired heaters and loading gantries. Tanks will undergo required 10 yearly and 5 yearly inspections as per API653; equipment will be inspected and maintained. The site will be audited internally on a 6 monthly basis.

3.4.3 DECOMMISSIONING PHASE

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 3-4**.

3.5 NEED AND DESIRABILITY OF THE PROJECT

The import demand of Bitumen, HFO and other Class 3 commodities into South African harbours has increased as oil refineries have decommissioned across the country and current production is no longer meeting the country's demand. In addition the existing import infrastructure is unable to cope with the increased demand. The proposed project is conceptualised based on the need to enhance service delivery in the Bulk Liquid Storage and Handling Industrial Sector. The proposed project will play a key role in the importation and redistribution of HFO, Bitumen and other products within South Africa.

Each of the products proposed for bulk storage holds value in the industry. FFS TT is bridging the gap in the supply of these products. Bitumen is used for the construction of roads and HFO is used for energy generation. Given the amount of developments taking place in the country and the energy crisis at hand, there is a demand for these products and services that FFS TT is providing.

4

PROJECT ALTERNATIVES

4 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the BA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, site locations, technology types, and project layouts. It is not always possible to provide alternatives to various categories as project designs and locations may already be located strategically or may be too costly for the project to proceed.

4.1 SITE ALTERNATIVES

The proposed tank expansion facility will be located within the current footprint of FFS TT's property. No site alternatives for the project can be provided or considered, due to the following reasons:

- FFS TT is an existing facility;
- The proposed project will be constructed within the property of FFS TT; and
- The proposed project will be constructed in a strategic location, adjacent to Maydon Wharf berths 8 and 9. The current property is leased from Transnet National Ports Authority (TNPA) (Pty) Ltd and there is no additional land available for the proposed project.
- Existing facility infrastructure will tie into the proposed expansion infrastructure, allowing for easy integration.

4.2 TECHNOLOGY ALTERNATIVES

The proposed tank expansion facility is guided by SANS 10089 for Class IIIB products and global best practice in the tank storage industry. This limits the amount of variability in terms of the technology and operational processes. No further technological alternatives for the tank expansion facility are available for assessment.

4.3 LAYOUT ALTERNATIVES

The expansion considered the existing tank configuration at the site and therefore no further layout alternatives have been considered

4.4 NO-GO ALTERNATIVE

The no-go alternative is essentially the option of not expanding the FFS TT facility in which case none of the negative and positive impacts described in Section 8 would come into effect.

Should the no-go alternative be implemented, FFS TT will be unable to increase their product commodity capacity as there will not be sufficient storage tanks. This will result in FFS TT not releasing the potential for additional sales and much needed product into the South African market.

Due to the facility already being located in an industrial Harbour zone and within the FFS TT property, there are minimal impacts that will be prevented if the project does not proceed.

5

GOVERNANCE FRAMEWORK

5 GOVERNANCE FRAMEWORK

5.1 NATIONAL LEGAL AND REGULATORY FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 5-1**.

Table 5-1 – Applicable National Legislation

Legislation	Description of Legislation and Applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 327 (as amended) (Listing Notice 1), GNR 325 (as amended) (Listing Notice 2) and GNR 324 (as amended) (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 326) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require a Scoping and Environmental Impact Assessment (S&EIA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A BA process must be followed. An EA is required and will be applied for with the EDTEA.
Listing Notice 1: GNR 327, as amended	**Activity 34** *The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution.* **Description:** Any process changes onsite that result in a change to the emission profile of the facility, even if these changes fall within authorised input and output criteria, require an Atmospheric Emission License variation. Furthermore,

Legislation	Description of Legislation and Applicability
	an Application for a Scheduled Activities Permit is required for the proposed activity.
	Activity 51 *The expansion and related operation of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by more than 80 cubic metres.* **Description:** Ten (10) new tanks will be constructed within the existing FFS TT facility, summating to an additional storage volume of 28 551 m^3 and a total facility storage capacity of 74 075 m^3. HFO, heated Bitumen, Slack wax and Illuminating Paraffin are listed as dangerous goods according to SANS 10234, and will occupy a maximum volume of 66 236 m^3 for the Phase II project.
	Activity 67 *Phased activities for all activities—* *(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices;* *excluding the following activities listed in this Notice-* *17(i)(a-d);* *17(ii)(a-d);* *17(iii)(a-d);* *17(iv)(a-d);* *17(v)(a-d);* *20;* *21;* *22;* *24(i);* *29;* *30;* *31;* *32;* *34;* *54(i)(a-d);* *54(ii)(a-d);* *54(iii)(a-d);* *54(iv)(a-d);* *54(v)(a-d);*

Legislation	Description of Legislation and Applicability
	55; *61;* *64; and* *65; or* *(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.* **Description:** The entirety of the FFS TT facility footprint is proposed to be developed with the inclusion of the Phase II project (this EA application). However there is potential that the tank configuration and capacity may be changed over time, therefore can be considered a phased activity.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The following environmental themes were identified for the FFS TT tank storage expansion facility: ▪ Agriculture Theme ▪ Animal Species Theme ▪ Aquatic Biodiversity Theme ▪ Archaeological and Cultural Heritage Theme ▪ Civil Aviation Theme ▪ Defence Theme ▪ Palaeontology Theme ▪ Plant Species Theme ▪ Terrestrial Biodiversity Theme
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence as defined in GNR 921. However, the contents of this BA Report will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework

Legislation	Description of Legislation and Applicability
Act, 2004 (Act No. 10 of 2004)	of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Programme (EMPr).
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, *inter alia*, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority." According to the National Protected Area Expansion Strategy (NPAES), there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.
The National Water Act (No. 36 Of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria.

Legislation	Description of Legislation and Applicability
	The facility obtains water from eThekwini water and thus does not need to apply for Section 21 or Section 22 water uses.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. The Amafa and Research Institute had previously issued the facility with a permit in terms of Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 5 of 2018 (Permit Ref: 21/246), and graded the entire facility as not conservation worthy, however if any heritage artefacts are found during excavation works, construction will cease and the find will be reported to Amafa.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the NEMA as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: (1) The minister may prescribe essential national standards – (a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or (b) for determining – (i) a definition of noise; and (ii) the maximum levels of noise. (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.

<table>
<tr><th>Legislation</th><th>Description of Legislation and Applicability</th></tr>
<tr><td>National Environment Management Air Quality Act (No. 39 of 2004)</td><td>NEMAQA came into effect on 11 September 2005. Persons undertaking such activities listed under GNR 893, as amended, are required to possess an Atmospheric Emissions License (AEL).

The National Dust Control Regulations (GNR 827) were promulgated in terms of Section 32 of NEMAQA, which aim at prescribing general measures for the control of dust in both residential and non-residential areas.

An AIR will be conducted to assess the impacts from the increased storage of chemicals at the facility, and subsequently the facility's existing AEL will be amended upon receipt of the environmental authorisation to be issued for the proposed project.</td></tr>
<tr><td>National ambient air quality standards as published in Government Notice 1210 of 2009 and Government Gazette Notice 486 of 2012</td><td>The National ambient air quality standards as published in Government Notice 1210 of 2009 and Government Gazette Notice 486 of 2012. The priority pollutants as defined by the NEM:AQA are sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10}), particulate matter ($PM_{2.5}$), benzene (C_6H_6) and carbon monoxide (CO). Of these, the NO_2, SO_2, benzene, PM_{10} and $PM_{2.5}$ standards will be applicable to this assessment.</td></tr>
<tr><td>Section 21 of the National Environmental Management: Air Quality Act – Listing of Activities</td><td>Listed activities and associated minimum emission standards (MES) were published in Government Notice 248, Government Gazette 33064 of 2010, in line with Section 21 of NEM:AQA. An amended list of activities was published in Government Notice 893, Government Gazette 37054 of 2013, Government Notice 551, Government Gazette 38863 of 2015 and further in Government Notice 1207, Government Gazette 42013 of 2018. FFS TT triggers Subcategory 2.4: Storage and Handling of petroleum products. The listed activity is detailed in Table 1.

Table 1 - Listed activities applicable to FFS TT
<table>
<tr><th>Category of Listed Activity</th><th>Subcategory of Listed Activity</th><th>Description of the Listed Activity</th></tr>
<tr><td>2: Petroleum industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass</td><td>2.4: Storage and handling of petroleum products</td><td>Storage and handling of petroleum products</td></tr>
</table></td></tr>
<tr><td>Civil Aviation Act (No. 13 of 2009)</td><td>Civil aviation in South Africa is governed by the Civil Aviation Act (SACAA) (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by SACAA as an agency of the Department of Transport. SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations.</td></tr>
</table>

Legislation	Description of Legislation and Applicability
	The DFFE Screening Tool Report identified Civil Aviation as having high sensitivity for the proposed project. The CAA have been included in the I&AP database.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
Occupational Health and Safety Act (No. 85 of 1993) - *Major Hazard Installation Regulations, GNR 692*	Definitions in the regulations state that a Major Hazard Installation (MHI) is an installation where a substance is stored that is listed in Schedule A of the General Machinery regulations of the Occupational Health and Safety Act and the quantity exceeds those stipulated. It is an installation where a substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident. A Major Incident is an event or occurrence of catastrophic proportions resulting from the use of plant and machinery, or from activities at a workplace. This may be interpreted in technical terms as follows: Catastrophic relates to the effects on the general public i.e. persons outside the boundary of the premises of the installation. People entering the premises through gates, although members of the public will be regarded as employees for the duration they remain on the premises. A fatality to one or more members of the public may be regarded as catastrophic. Exposing a member of the public to hazard effects which exceeds the following thresholds: — Thermal radiation: 12 kW / m2 for 1 minute. — Engulfed in a flash fire — Blast overpressure: 14 kPa. — Toxic gas dose: Equivalent Emergency Planning Response Guideline ERPG 3 for 1 hour and chance of fatality > 1 %. — Toxic liquid drench: More than 50 % body coverage [severe injuries or fatalities]. The facility's MHI assessment has been updated to assess the proposed Phase II facility expansion, and is included in this report.
SANS 1461:2018 - *Major Hazard Installation - Risk Assessments*	The regulation requires that a risk assessment be carried out by a Department of Labour Approved Inspection Authority (AIA). For this installation a Quantitative Risk Assessment is required and is aligned with the standards for Major Hazard Installation Risk Assessments. Risk is made up of two components: • The probability of a certain magnitude of hazardous event occurring. • The severity of the consequences of the hazardous event.

Legislation	Description of Legislation and Applicability
	A risk assessment is, therefore, typically comprised of the following aspects: • Identification of the likely hazards expected to be associated with the operation of the installation; • Quantification of the hazards in terms of their likely frequency and magnitude; • Determination of the consequences of the hazards and their severity, should these occur; • Estimating the risk and comparing this with certain acceptability criteria.
API 650 – Vertical flat-bottomed tanks	The API 650 is the American standard for welded flat-bottomed vertical storage tanks. This standard dictates tank design, manufacture, welding, inspection and installation requirements. The API 650 is the American standard for welded flat-bottomed vertical storage tanks. This standard dictates tank design, manufacture, welding, inspection and installation requirements. The API 650 is widely used for tanks designed to withstand low internal pressures, for the storage of typical products such as crude oil, petrol, chemicals and water.
API 653 – Aboveground Storage Tank Inspector	The American Petroleum Institute initiated an API 653 Aboveground Storage Tank Inspector Certification Program with the participation of storage tank owners and users. It establishes a uniform national program that assists state and local governments in aboveground storage tank regulations. The API 653 Aboveground Storage Tank Inspector must have a broad knowledge base relating to tank inspection and repair of aboveground storage tanks, and will satisfy the minimum qualifications specified in API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction. API 653 certification is valid for a three-year term and is accredited by the American National Standards Institute (ANSI). This accreditation ensures that the exam has been developed to the highest standard for openness and integrity and meets the rigorous requirements established under the International Organization for Standardization (ISO) 17024.
SANS 10089-1: 2008 - The petroleum industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations	The petroleum industry: Part 1: Storage and distribution of petroleum products in above-ground bulk installations, covers the layout and design of petroleum bulk depots as well as the installation of equipment used for the handling, storage and distribution of petroleum products.
SANS 10228:2012 - *The identification and classification of dangerous goods for transport by road and rail modes*	SANS 10228 covers the identification of dangerous goods that are capable of posing a significant risk to health and safety or to property and the environment. Dangerous goods are classified in nine classes and three packing groups in accordance with the United Nation. This code forms part of the requirements for assessing the dangerous goods aspect under the MHI regulations.
SANS 10234:2019 - *Globally Harmonized System of classification and labelling of chemicals (GHS)*	SANS 10234 covers the harmonized criteria for the classification of hazardous substances and mixtures, including waste, for their safe transport, use at the workplace or in the home according to their health, environmental and physical hazards.

Legislation	Description of Legislation and Applicability
	This code forms part of the requirements for assessing the dangerous goods aspect under the MHI regulations.

5.2 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 5-2 – Provincial Plans

Applicable Plan	Description of Plan
eThekwini Municipality Integrated Development Plan (2022/23)	The main purpose of the Integrated Development Plan (IDP) is to foster more appropriate service delivery by providing the framework for economic and social development within the municipality. In doing so it contributes towards eradicating the development legacy of the past, operationalises the notion of developmental local government and foster a culture of co-operative governance amongst the three spheres. Integrated development planning is a process whereby municipalities prepare strategic development plans for a five-year period. IDPs are the main platform through which sustainable provision of service delivery could be achieved. They intend to promote co-ordination between local, provincial and national government. Once adopted by Council, these plans should inform planning, decision making, budgeting, land management, promotion of local economic development, and institutional transformation in a consultative systematic and strategic manner. eThekwini's municipal visions is "By 2030, eThekwini will enjoy the reputation of being Africa's most caring and liveable City, where all citizens live in harmony". This will be achieved by growing the municipal economy, providing equal opportunities and meeting the citizens basic needs in order to enjoy a high quality of life. The strategic delivery of eThekwini's IDP is informed by an 8 Point Plan: • Develop and sustain their spatial, natural and built environment; • Development of a prosperous, diverse economy and creation of employment; • Creating a quality living environment; • Fostering a socially equitable environment; • Creating a platform for growth, empowerment and skills development; • A vibrant and creative city – the foundation for sustainability and social cohesion; • Good governance and responsive local government; • Financially accountable and sustainable municipality.
eThekwini Municipality Spatial Development Framework (2022/2023)	The eThekwini Municipal Spatial Development Framework (MSDF) prepares and adopts requirements form the Municipal Systems Act, 2000 (No.32 of 2000), Spatial Planning and Land Use management Act, 2013 (SPLUMA)(Act No. 16 of 2013) and the eThekwini Municipal: Planning and Land Use By-Law (2016). The MSDF on the implementation of the IDP, by informing spatial distribution of land uses within the Municipality and identifying spaces for

Applicable Plan	Description of Plan
	transformational targets. The MSDF provides strategic multi-sectoral planning for the Local Area Plans, Precent Plans, Special Projects and Built Environment Performance Plans, Rural Settlement plans and Land Use Schemes. Each plan is then accompanied by their land use proposals and detailed implementation plans with proposed projects to be implemented in order to reach these targets. The MSDF has the following benefits: • It facilitates effective use of scarce land resources; • It facilitates decision making with regard to the location of service delivery projects; • It guides public and private sector investment; • It strengthens democracy, inclusivity and spatial transformation; • It promotes intergovernmental coordination on spatial issues; • It serves as a framework for the development of lower order plans and Scheme and is the basis for land development decisions; • It guides and informs the spatial location of municipal infrastructure investment and spatial priorities; and provides visual representation of the desired urban form of the municipality in the short, medium and long term. The MSDF notes that the facility forms part of the Port of Durban which is the primary contributor to eThekwini's economy which is of provincial and national significance. And enhanced capacity at the harbour would further aid the MSDF's Strategic Investment Areas.
KwaZulu-Natal Amafa and Research Institute Act, 2018	The KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No. 05 of 2018) was established to recognise the KwaZulu-Natal Amafa and Research Institute as the provincial heritage resources authority for the KwaZulu-Natal in terms of Section 23 of the National Heritage Resources Act, 1999, and to amalgamate *Amafa aKwzaZulu-Natali* in terms of the KwaZulu-Natal Heritage Act, 2008. The aim of the of the Institute and Act is to identify, conserve, protect, manage and administer heritage resources, whilst researching and generating relevant knowledge to provide solutions within the field of heritage in the province. The Amafa and Research Institute had previously issued the facility with a permit in terms of Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 5 of 2018 (Permit Ref: 21/246), and graded the entire facility as not conservation worthy, however if any heritage artefacts are found during excavation works, construction will cease and the find will be reported to Amafa.

5.3 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 5-3 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 5-3 – Additional Permits and Authorisations required for the proposed development

Permits / Authorisation	Legislation	Relevant Authority	Status
Total Demolition at Portion 1 of Erf 10019 –	Section 37 of the KwaZulu-Natal Amafa	KwaZulu-Natal Amafa and Research Institute	Issued (27/05/2021 to 27/05/2024)

Permits / Authorisation	Legislation	Relevant Authority	Status
55, 57 Johnstone Road and 14 Fletcher Road, Maydon Wharf, Durban Permit Ref: 21/246	and Research Institute Act, No.05 of 2018		
Provisional Air Emissions License (AEL 123/S3)	Section 41(1) of the National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004), in respect of Listed activity Category 2, Sub-Category 2.4	eThekwini Municipality	Issued 10/12/2021
Provisional AEL 123/S3	Section 41(1) of the National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004), in respect of Listed activity Category 2, Sub-Category 2.4	eThekwini Municipality	Issued 06/06/2023
Scheduled Activities Permit	Section 5.1 of the Scheduled Activities Bylaws for eThekwini Municipality	eThekwini Municipality	Issued 10 October 2022

6

BASELINE ENVIRONMENT

6 BASELINE ENVIRONMENT

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed Project is located. It is important to gain an understanding of the Project area and its surroundings, as it will provide for a better understanding of the receiving environment in which the Project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the proposed Project (i.e. the current, or status quo, environment) against which environmental impacts of the proposed Project can be assessed and future changes monitored.

The area has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by the specialist appointed to undertake baseline and impact assessments for the proposed Project.

6.1 PHYSICAL ENVIRONMENT

6.1.1 TEMPERATURE AND RAINFALL

The following is extracted from the Air Impact Assessment compiled by WSP Group Africa (Pty) Ltd and included in ***Appendix G.1.***

Ambient air temperature influences plume buoyancy as the higher the plume temperature is above the ambient air temperature, the higher the plume will rise. Further, the rate of change of atmospheric temperature with height influences vertical stability (i.e. mixing or inversion layers). Rainfall is an effective removal mechanism of atmospheric pollutants.

Figure 6-1 illustrates the average monthly temperature, temperature range (maximum and minimum) and total rainfall from the WRF AERMET-ready dataset. Clear seasonal variation is evident in the temperature and rainfall values in the area. The coastal area typically receives the highest levels of rainfall during the spring (1007 mm) and summer months (1080.8 mm) with low levels of rainfall during the winter months (435.6 mm). The station recorded average summer temperatures ranging from 23.4°C to 24.6°C, whilst average winter temperatures ranged from 18.8°C to 19.1°C.

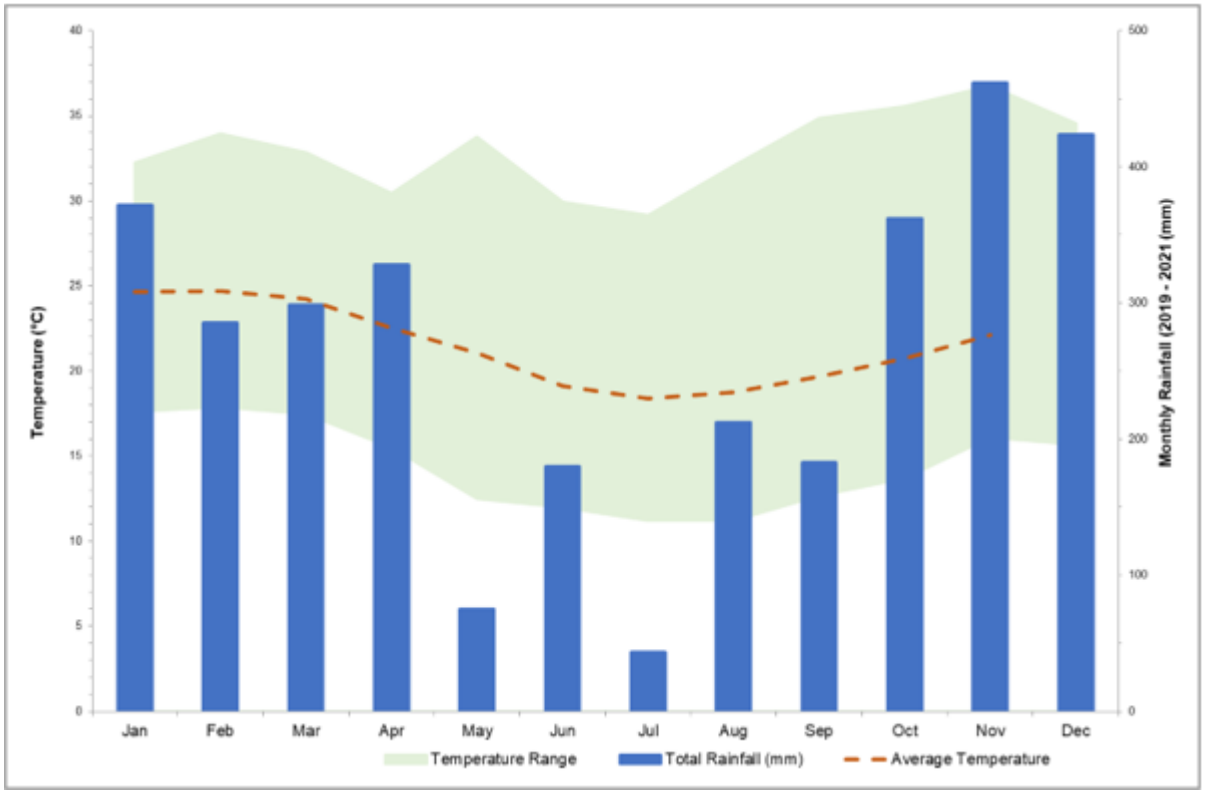


Figure 6-1 - Total monthly average temperature range and total rainfall at FFS TT from the WRF AERMET modelled data for the January 2019 to December 2021 period

6.1.2 WIND FIELD

The following is extracted from the Air Impact Assessment compiled by WSP Group Africa (Pty) Ltd and included in ***Appendix G.1.***

Wind roses are useful for illustrating the prevailing meteorological conditions of an area, indicating wind speeds and directional frequency distributions. In the following wind roses, the colour of the bar indicates the wind speed while the length of the bar represents the frequency of winds *blowing from* a certain direction (as a percentage).

Period, seasonal and diurnal wind roses for the modelled AERMET WRF meteorological data and Pier 2 meteorological station are presented in **Figure 6-5** and **Figure 6-6** respectively. Typical wind fields have been analysed using Lakes Environmental WRPlot Freeware (Version 7.0.0) for the full period (January 2019 to December 2021); diurnally for day (06h00 – 18h00), and night (18h00 – 06h00); and seasonally for summer (December, January and February), autumn (March, April and May), winter (June, July and August) and spring (September, October and November).

AERMET WRF

Figure 6-5 illustrates the modelled AERMET WRF meteorological data. The following is highlighted:

- North-easterly winds prevailed with calm conditions occurring 3.51% for the entire period (January 2019 to December 2021).
- Average wind speed for the period under review of 3.85 m/s, with few winds exceeding 14.7 m/s at times, particularly from the northeast region.

- Diurnal variations in wind originate predominantly from the northeast during the day-time period (06:00 to 18:00), while north-northeast winds prevailed during the night-time period (18:00 to 06:00).
- Minimal seasonal variation in winds is seen for the period under review with winds prevailing from the north-northeast during spring (September, October and November) and summer (December, January and February) and northeast winds during the autumn (March, April and May) and winter months (June, July and August).

PIER 2

Figure 6-6 illustrates the wind profile from the Pier 2 meteorological station. The following is highlighted:

- Calm conditions occurred 11.36 % of the time for the entire period (January 2019 – December 2021).
- Winds dominate from the east-southeast, west and southwest.
- Average wind speed of 3.2 m/s were noted for the period under review, with few winds exceeding 16.6 m/s at times, particularly from the north-northeast.
- Diurnal variations in wind originates predominately from the east-southeast and southwest during daytime (06:00 – 18:00) period, whilst west-southwest and east winds prevailed during nigh-time period (18:00 -06:00).
- Seasonal variation in wind originates predominately from the east-southeast and west-southwest during the summer (December, January and February) and autumn (March, April and May) months. Stronger high intensity winds were experienced from the west-southwest and east-northeast during the winter (June, July and August) and spring (September, October and November) months.
- A seasonal peak wind speed of 13.0 m/s occurred during the spring months and the highest average wind speed of 3.5 m/s occurred during the spring months.

The predominant wind direction from the Pier 2 station differs from the WRF modelled data due to its location and influences of land/sea interactions.

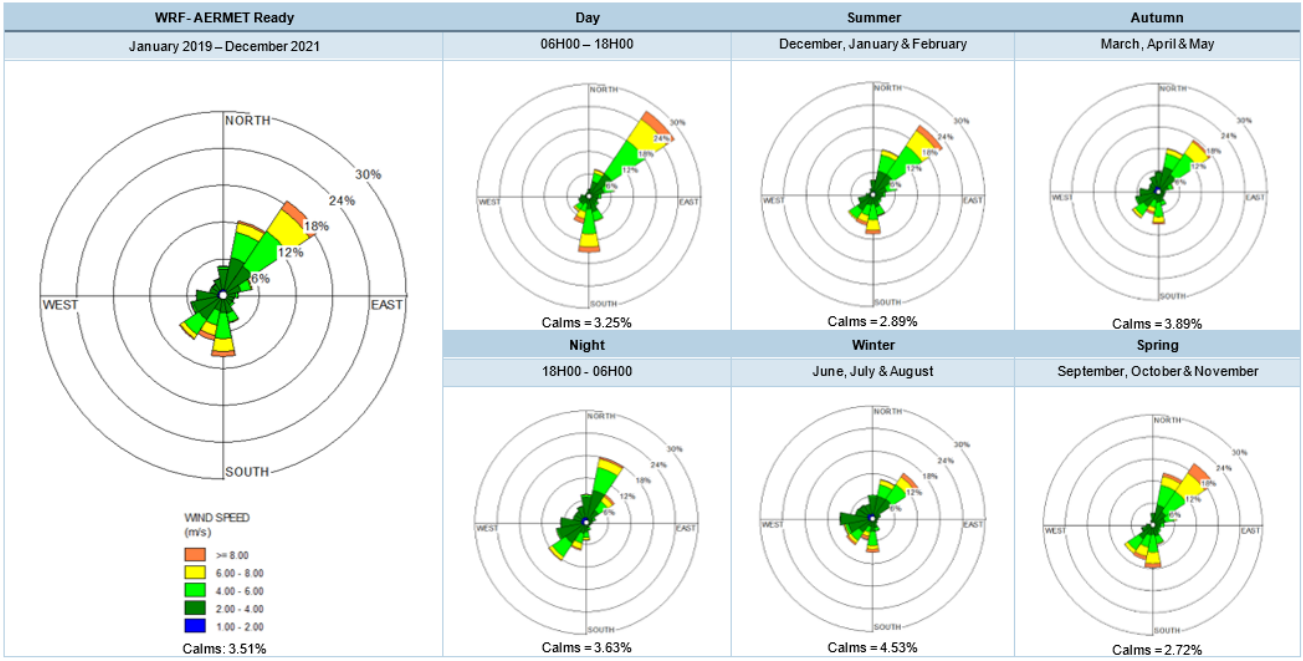


Figure 6-2 - Local wind conditions for FFS TT for the period January 2019 to December 2021 using the AERMET WRF data

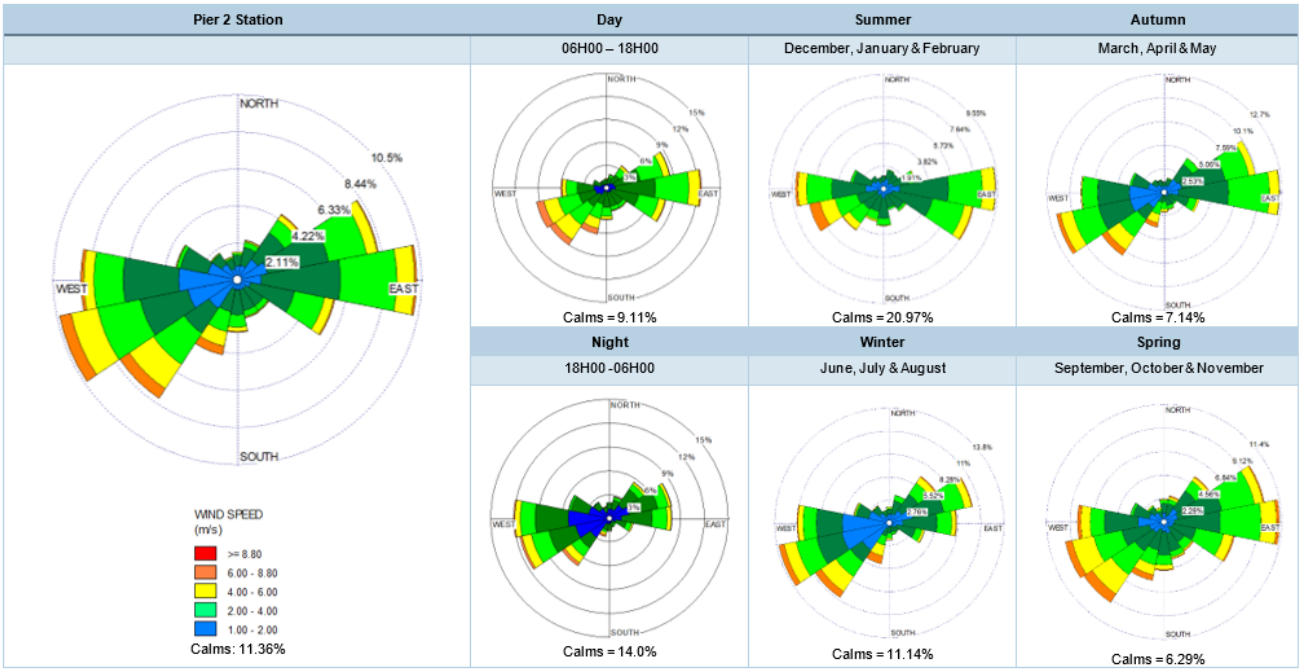


Figure 6-3 - Local wind conditions from the Pier 2 meteorological station for the period January 2019 to December 2021

6.1.3 TOPOGRAPHY

The proposed development area is approximately 12 415 m^2, and is approximately 240 m from Maydon Wharf berths 8 and 9. The site is relatively flat due to historical development of the area and transformation for harbour activities.

The majority of groundcover is hardstanding surfaces, i.e., concrete and bitumen-seal. The area at which majority of the expansion will take place is a combination of bare soil, concrete foundations and existing buildings.

The topography of Maydon Wharf has been modified through various dredging and reclamation activities to facilitate port operations, which have resulted in the creation of storage facilities for cargo, and quays and berths for vessel mooring. Maydon Wharf has a relatively flat topography, with an elevation of approximately 5 meters above sea level.

There are no topographical limitations associated with the proposed development of the site.

6.1.4 GEOLOGICAL CONTEXT

The Maydon Wharf area is situated within the Durban System of the Natal Group, which is part of the Karoo Supergroup. The Karoo Supergroup is a vast sequence of sedimentary rocks that were deposited between the late Carboniferous and early Jurassic periods, approximately 300 to 180 million years ago. The Natal Group is the uppermost unit of the Karoo Supergroup, and it is composed of a series of alternating sandstones, mudstones, siltstones, and coal seams. The site is underlain by Quaternary alluvium and sediments of the Berea formation (2930 Durban, 1:250 000 Geological series), and characterised by greyish sandy, excessively drained soils.

6.1.5 HYDROLOGY

The site falls within U60F quaternary catchment in the Pongola - Umzimkulu Water Management Area (WMA) 11, with a catchment area of 272 km^2. Mean annual precipitation is approximately 967 mm, whilst mean annual evaporation is approximately 1200 mm. The Umbilo River flows south east and Mhlatuzana River flows east towards the Durban Harbour, with their point of confluence located 750 m upstream of the Harbour.

Urban flood hazard for eThekwini Municipality is classified as low. This means that there is a chance of more than 1% that potentially damaging and life-threatening river floods occur in the coming 10 years (return period of c. 1 in 1000 years) (www.thinkhazard.org). River flood hazard is classified as medium. This means that there is a chance of more than 20% that potentially damaging and life-threatening river floods occur in the coming 10 years (www.thinkhazard.org).

6.1.6 GROUNDWATER

Groundwater depth is anticipated to be > 15 meters below ground level. Localised flow is anticipated to be in a south-westerly direction across the facility. The underlying natural geology represents a minor aquifer, moderately yielding system of variable water quality with a mean annual recharge of 50 – 75 mm. The aquifer is classified as having a moderate vulnerability to contamination and has a medium susceptibility to anthropogenic activities. Electrical conductivity is estimated at 150 – 370 mS/m and Total Dissolved Solids at 750 – 1 000 mg/L.

6.2 AIR QUALITY

The following is extracted from the Air Impact Assessment compiled by WSP Group Africa (Pty) Ltd and included in ***Appendix G.1.***

6.2.1 AMBIENT AIR QUALITY

6.2.1.1 Existing Sources of Emissions

A qualitative discussion of identified emission sources in the vicinity of the study site is provided below. Key emission sources in the region are industrial activities, vehicle tailpipe emissions and miscellaneous fugitive emissions. These emission sources contribute towards the air quality status quo within the region.

Industrial Emissions

The Maydon Wharf area is home to many heavy industries including, but not limited to, various types of bulk storage and handling, import and export operations to name a few. Industrial activities release gaseous and particulate emissions into the atmosphere. The main pollutants released from combustion processes include volatile organic compounds (VOCs), SO_2, CO, carbon dioxide (CO_2), nitrogen oxides (NO_x) and particulates.

Vehicle Tailpipe Emissions

Maydon Wharf is the main container port on the South African Coastline, which receives extremely high volumes of heavy vehicle (i.e. cargo trucks) activities. Atmospheric pollutants emitted from vehicles include VOC, CO, CO_2, NO_x, SO_2 and particulates. These pollutants are emitted from the tailpipe, from the engine and fuel supply system, and from brake linings, clutch plates and tyres.

Hydrocarbon emissions, such as C_6H_6, result from the incomplete combustion of fuel molecules in the engine. CO is a product of incomplete combustion and occurs when carbon in the fuel is only partially oxidized to CO_2. NO_x is formed by the reaction of nitrogen and oxygen under high pressure and temperature conditions in the engine. SO_2 is emitted due to the high sulphur content of the fuel. Particulates such as lead originate from the combustion process as well as from brake and clutch linings wear (Samaras and Sorensen, 1999).

Miscellaneous Emissions

Miscellaneous emissions refer to fugitive dust emissions which includes but not limited to wind erosion over exposed areas/stockpiles.

6.2.1.2 Local Air Quality

Ambient air quality monitoring is currently not undertaken at FFS TT. Data was sourced from two monitoring stations located within a 20km radius from the facility namely, Jacobs Balfour and Settlers NAQI (relevant to this study) which is owned and operated by the eThekwini Metropolitan Municipality. Benzene and other criteria pollutants are monitored at these stations, however data availability has been poor and inconsistent. Jacobs Balfour station had a data availability of 5% for benzene while the Settlers school station had interspersed data capture with an availability of less than 49%. Due to the poor availability, a review on the local air quality have been omitted from this report.

6.2.2 SENSITIVE RECEPTORS

FFS TT is in a designated industrial area within the City of Durban and is surrounded by:

- Residential communities located within a 10 km radius.
- Hospitals and education institutes within a 5m radius.
- Wood chip warehouse located adjacent to the facility.
- Various port activities, including small and large industries within a 5km radius of the site.
- National highway M4 located 400m northeast from the site.

Sensitive receptors, as defined by the United States Environmental Protection Agency (USEPA) include, but are not limited to, hospitals, schools, day-care facilities, elderly housing, and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides and other pollutants. Extra care must be considered when dealing with pollutants in proximity to areas recognised as sensitive receptors. Based on this definition the residential, educational, and recreational land in the surrounding area are considered sensitive receptors.

For this study, sensitive receptors were sourced from 1:6300 digital raster graphic (DRG) maps and verified using Google Earth Pro. As recommended in the *Modelling Regulations* educational, recreational and residential communities within a 10km radius of the site were identified and displayed in **Figure 6-4** and **Table 6-1.**

Table 6-1 –Sensitive receptors within a 10km radius of the FFS TT

ID	Receptor Name	Receptor Type	Distance from	Direction	Latitude (°S)	Longitude (°E)
SR1	King Edward VI Hospital	Hospital	1.07	West	29.881712	30.990544

SR2	STC Durban Campus	Educational	0.80	West	29.880574	30.991685
SR3	Penzance Primary School	Educational	1.48	Northwest	29.876782	30.987309
SR4	Glenhaven Retirement Village	Residential	1.54	Northwest	29.874517	30.989694
SR5	KZN Coastal TVET College	Educational	1.20	Northwest	29.874546	30.993938
SR6	Umbilo FET College	Educational	1.38	Northwest	29.876182	30.990582
SR7	Durban Primary School	Educational	1.32	West	29.880782	30.987529
SR8	Seventh-Day Adventist Church	Educational	1.36	West	29.882975	30.987009
SR9	Bluff Residential Area	Residential	2.78	Southeast	29.908215	31.009941
SR10	Durban Academy High School	Educational	2.91	Southeast	29.900166	31.025081
SR11	Bluff South Residential	Residential	4.14	Southeast	29.918658	30.997865
SR12	Clairwood Residential	Residential	4.49	Southwest	29.909139	30.969761
SR13	Phambili High School	Educational	3.65	Southwest	29.902892	30.974785
SR14	Glenmore Residential	Residential	2.84	West	29.880111	30.974574
SR15	Umbilo Residential	Residential	2.35	West	29.887209	30.979666
SR16	Seaview Residential	Residential	3.77	Southwest	29.895925	30.969049
SR17	Glenwood Residential	Residential	1.69	Northwest	29.871834	30.990080
SR18	Durban CBD	Business district	2.88	Northeast	29.859023	31.020336
SR19	Berea Residential	Residential	3.50	North	29.851771	30.991837
SR20	Musgrave Residential	Residential	3.95	North	29.847305	30.994422
SR21	Glenwood Residential North	Residential	2.00	Northwest	29.864371	31.001199
SR22	Davenport	Residential	1.60	North	-29.864371°	31.001191°
SR23	Essenwood Residential	Residential	4.85	North	29.838229	31.008183
SR24	Lenmed Shifa Hospital	Hospital	5.87	North	29.831484	30.985186
SR25	Melvern Residential	Residential	7.83	North	29.885875	30.923441
SR26	Yellowwood Park Residential	Residential	7.14	Southwest	29.914239	30.942279

SR27	Morningside Residential	Residential	6.26	Northwest	29.826520	31.009675

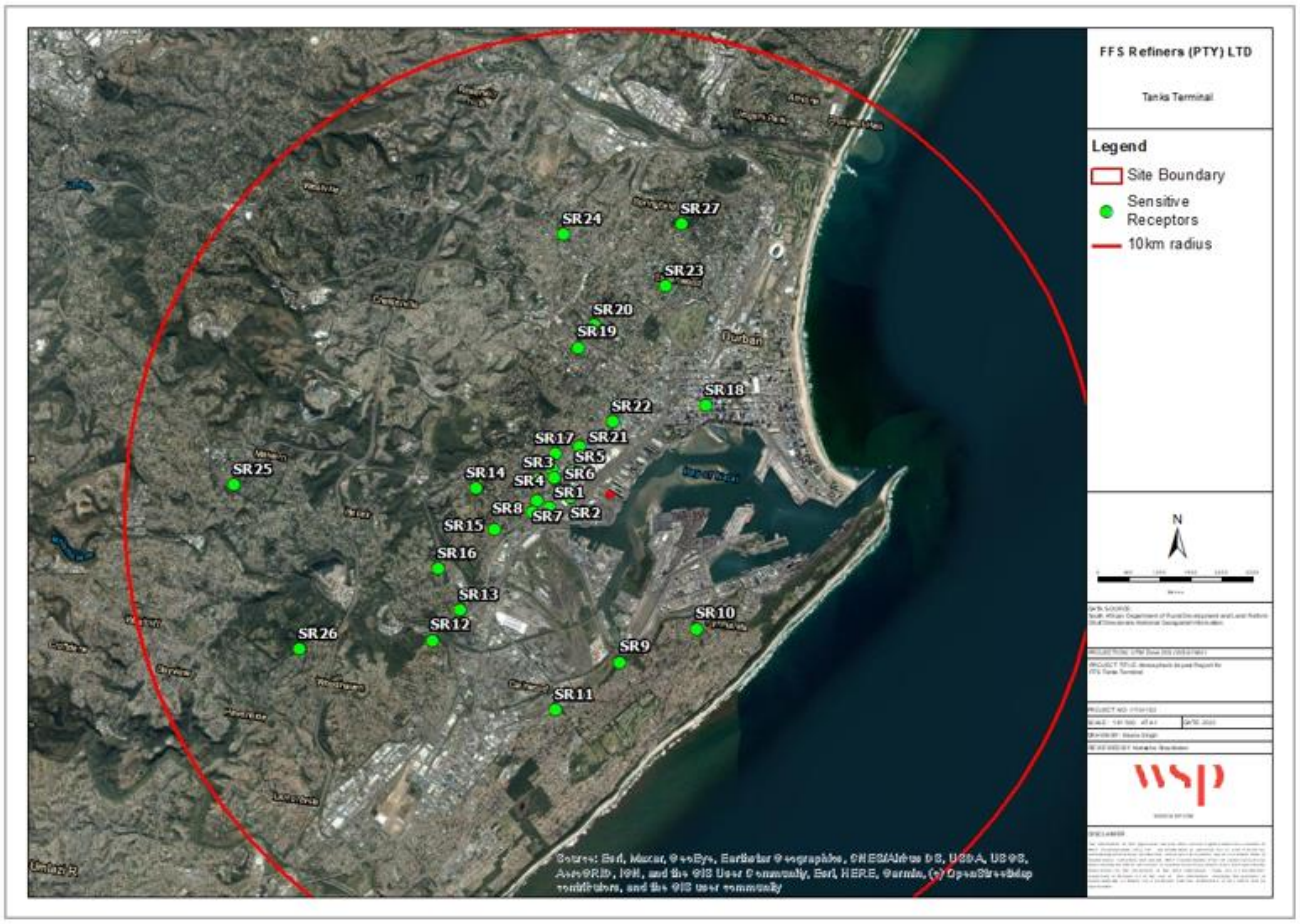


Figure 6-4 - Sensitive receptors within a 10km radius from FFS TT

6.2.3 DESCRIPTION OF SOURCE EMISSIONS

An emissions inventory is a list of air pollution sources, their physical and chemical parameters, as well as the quantification of emissions. Emissions are calculated using emission factors or mass balance approaches, requiring chemical and activity data inputs. Emissions for FFS TT are discussed below.

6.2.3.1 Point Source Fugitive Emissions

Storage Tanks

Volatile Organic Compound (VOC) emissions from storage tanks that contain organic liquids, especially highly volatile liquids, occur because of evaporative losses of the liquid during its storage and as a result of changes in the liquid level. The emission rates are dependent on the tank design. The two significant types of emissions from tanks are breathing and working losses. Breathing loss is the expulsion of vapour from tanks through vapour expansion and contraction, which is the result of changes in temperature and barometric pressure. This loss occurs without any change in liquid level in the tank. The loss from filling and emptying the tank is called working loss. Emissions during filling operations are due to an increase in the liquid level in the tank. As the liquid level increases, the pressure inside the tank exceeds the relief pressure and vapours are expelled from the tank.

The modelling regulations recommends the use of the USEPA and American Petroleum Industry (API) TANKS 4.0.9d model (TANKS) for estimating emissions from bulk liquid storage tanks. TANKS is windows-based software based on the emission estimation procedure from Chapter 7 of the USEPA's compilation of air pollutant emissions factors (AP-42). TANKS uses chemical, meteorological, roof fitting, rim seal data, tank dimensions and physical parameters (i.e. colour and condition of the shell and roof) to generate breathing and working loss estimates for various types of storage tanks. **Table 6-2** presents the total possible[7] throughput for each product per year.

Table 6-2 – Maximum throughput per year

Product	Maximum throughput / year	Unit
MEG	20,350	m^3
DEG	1,010	m^3
Vegetable oil/bio diesel	51,770	m^3
Molasses	37,223	m^3
Base oil/slack wax	51,096	m^3
HFO	51,154	m^3
Bitumen	21,889	m^3
IP	79	m^3
Fire water	337	m^3

The following assumptions were taken into consideration for emission calculations:

- Normal operating hours of 24 hours per day, seven days a week, was assumed and confirmed by FFS TT.
- Emission rates for bulk storage tanks were simulated using the USEPA TANKS 4.0.d emissions estimation model as recommended by the Modelling Regulations.
- Chemical databases already preloaded into the TANKS model was used to estimate emission rates for chemicals stored on site.
- Bitumen was simulated as Distillate fuel oil no 2 in the TANKS model. Bitumen has similar chemical properties (i.e. vapour pressure) and is the closest match to Distillate Fuel Oil No 2.

[7] This is based on all tanks identified for storage of the specified product only storing the specified product throughout the year.

This assumption is consistent with other specialist studies conducted for similar industries in South Africa.

- Heavy Fuel Oil (HFO) was simulated in TANKS as Residual Oil No 6, while illuminated Paraffin was simulated as Jet Kerosene. This assumption is consistent with other specialist studies conducted for similar industries in South Africa. Residual Oil No 6 has no speciated profile within the TANKs model due to the low detection level of BTEX within the chemical.
- All predicted VOC concentrations have been assumed to comprise 100% of C_6H_6 as a worst-case scenario (and in the absence of the VOC composition). Given the Benzene (C_6H_6) standard is the most stringent standard for VOCs, VOCs have thus been compared to the annual standard of C_6H_6.
- The tanks were modelled in AERMOD using parameters that are set with a gas exit velocity of 0.001 m/s and a diameter of 0.001 m, as per the Modelling Regulations.

Small Fired Heaters

Point source parameters for the small, fired heaters at FFS TT, were obtained from the Client. These parameters are provided in **Table 6-3**. Calculated emission rates (g/s) are based on stack emissions information provided by FFS TT (mg/Nm^3).

Table 6-3 – Small fired heater parameters and emission rates

Source ID	Heater 1	Heater 2
Source name	Point source	Point source
Stack height (m)	10	10
Stack Diameter (m)	0.45	0.45
Gas exit velocity (m/s)	9.3	9.3
Gas exit Temp (℃)	380	380
Flow Rate (Nm^3/s)	0.63	0.63
Emission rates		
SO_2 (mg/Nm^3)	490	490
SO_2 Emission Rate (g/s)	0.31	0.31
NO_2 (mg/Nm^3)	300	300
NO_2 Emission Rate (g/s)	0.19	0.19
PM_{10} (mg/Nm^3)	65	65
PM_{10} Emission Rate (g/s)	0.04	0.04
$PM_{2.5}$ (mg/Nm^3)	32.50	32.50
$PM_{2.5}$ Emission Rate (g/s)	0.02	0.02

The following were taken into consideration for the emission calculations:

- Normal operating conditions of 24 hour per day, 7 days per week.
- Emissions rates for PM, NO_2 and SO_2 were provided by FFS TT.
- Based on current information that FFS TT will not operate any boilers >10 MW heat input, the operation of heaters at FFS TT are unlikely to trigger Section 23 of NEM:AQA, Subcategory 2.1: Combustion Installations of listed activities (e.g. small boilers, most applicable in this case). As such, at this stage, FFS TT is not required to conform to any emission standards and reporting stipulated by these regulations nor hold a certificate to operate controlled emitters (They are however required to register these heaters with the eThekwini municipality). Should this change during the course of the project, this will need to be reassessed and addressed accordingly.

6.2.3.2 Fugitive Emission (Area Source)

Product Loading To Road Tankers For Export

Storage tanks loading and emptying emissions are considered in TANKS as working losses. Emissions due to filling operations are the result of an increase in the liquid level in the tank. As the liquid level increases, the pressure inside the vapor space increases and vapours are expelled from the tank through the vent(s) on the fixed roof. No emissions are attributed to emptying, as the increasing size of vapor space during emptying is assumed to exceed the rate at which evaporation increases the volume of vapours. This translates to no emissions occurring during the emptying of a fixed roof tank, as flow through the vents would be into the tank.

The Total Volatile Organic Compounds (TVOCs) emissions resulting from the loading of product to bulk (road) tankers for export can be calculated using the **Equation 1** from Australia's National Pollutant Inventory (NPI) Emission Estimation Technique manual (EETM) (National Pollutant Inventory, 2004):

$$E_{kpy,TVOC} = 0.1203 \times \frac{(S \times P \times M \times V_m)}{T} \qquad \textbf{Equation 1}$$

where:

$E_{kpy,TVOC}$ =	total VOC loading emissions (kg/annum)	
S	=	saturation factor (dimensionless); for submerged loading for normal services at a factor of 0.6
P	=	vapour pressure of material loaded at temperature T, (kPa)
M	=	vapour molecular weight, (kg/kg-mole)
Vm	=	volume of material loaded, (1000 l/annum)
T	=	temperature, (K)
0.1203 =	constant, (kg-mole x K)/(kPa x 1000L)	

To account for loading losses from tanker loading, the S Factor for road / rail tanker loading was applied. Chemical properties will be based on the values used in TANKS. The emission calculation equation presented above is applied using a conservative approach where the vapour pressure of Distillate fuel Oil No.2 and maximum volume of material loaded/offloaded at the facility.

Evaporative loss from filling is called working loss. Emissions due to filling operations are the result of an increase in the liquid level in the tank. As the liquid level increases, the pressure inside the vapor space increases and vapours are expelled from the tank through the vent(s) on the fixed roof. No emissions are attributed to emptying, as the increasing size of vapor space during emptying is assumed to exceed the rate at which evaporation increases the volume of vapours. This translates to no emissions occurring during the emptying of a fixed roof tank, as flow through the vents would be into the tank. To account for loading losses from this activity, the S Factor for road / rail tankers

was applied as a substitute. **Table 6-4** presents the total number of product loaded (worse case) and emission rate for material loaded/offloaded from FFS TT.

Table 6-4 – Product throughput and calculated emission rate for material loading loaded at Durban

Site name	Worst case throughput of product loaded (m^3/year)	VOCs emission rate (g/s)
Bay 1	51154	0.003
Bay 2	51154	0.003
Bay 3	51154	0.003
Bay 4	51154	0.003
Bay 5	51154	0.003

The following were taken into consideration for the emission calculations:

- Normal operating conditions of 24 hours per day, 7 days per week.
- A conservative approach, using maximum volume/throughput of product stored on site to estimate loading/offloading loss.
- The vapours displaced from the process vessels are assumed to be identical to the vapours from the materials being loaded.
- Five loading bays/gantries were assumed to be on site.

6.3 SOCIO-ECONOMIC ENVIRONMENT

The facility currently employs 15 people on a permanent basis, which comprise; Accountants (3), administration (1), Production (8), Environmental Officer (1), Management (1) and Human Resources (1). This excludes temporary jobs that arise from *ad hoc* activities that occur at the facility.

6.3.1 DEMOGRAPHICS

According to the eThekwini Municipality 2022/2023 Integrated Development Plan (IDP), the projected population total for 2023 is estimated at 4 095 412. This is an annual increase of 1.13%, based off the 2001 census data of 3.09 million residents of eThekwini (IDP, 2022/2023).

The IDP indicates a steady increase in population, with high birth and infant mortality rates and a low life expectancy, with the highest population of cohorts being in the 20 to 24 year age group (**Figure 6-5**). According to StatsSA Forecast for 2020, the age demographic within eThekwini comprise of Individuals aged between 0-14 at 25.28%, 15-34 years at 34.46%, 35 to 59 at 31% and those over 60 at 11%. Indicating a young population of 59.74% of the population below the age of 35. Whilst the economically active group of the population rages between 15 to 59 years and comprise 65.37% of the population (IDP, 2022/2023).

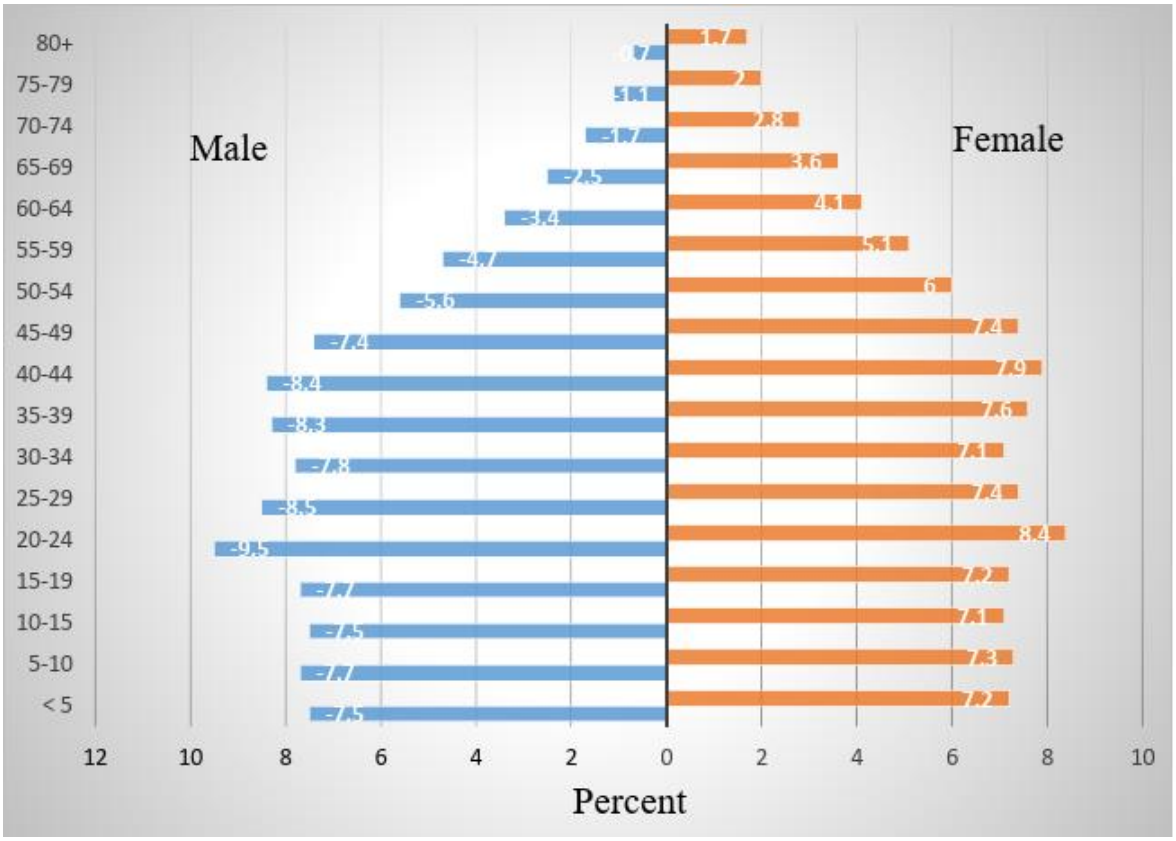


Figure 6-5 - eThekwini population pyramid (Source: Stats SA, 2021 - Population Estimates)

The municipality comprises 49.9% male and 50.1% female, with a ratio of 99 males per 100 females. The ethnic make-up of the municipality comprises of African (74%), Indian (17%), White (7%), Coloured (2%) and other (0,4%) (IDP, 2022/2023).

The education profile of the municipality indicates that 25% of the population has primary education, 26% of the population has secondary level education (matric), 7% has no schooling, whilst just 5% of the population tertiary level education (IDP, 2022/2023). There's been a slight increase in the level of literacy between 2016 to 2020, from 88.1% to 90.7% respectively.

6.3.2 LOCAL AND REGIONAL CONTEXT

The eThekwini Municipality spans an area of 2 555 km^2, extending from Tongaat to the north, to Umkomaas in the South, with Cato ridge and the Indian Ocean coastline demarcating its western and eastern boundaries respectively (MSDF, 2022-2023).

The largest city in eThekwini Metropolitan Municipality is the city of Durban (eThekwini), and the third largest city in South Africa, owing to South Africa's busiest port and a high tourism income. The main economic sectors include: finance (22%); manufacturing (22%); community services (18%); trade (16%); transport (16%); construction (3%) and electricity (2%) (Local Government Handbook, 2016).

At the close of 2020, eThekwini contributed approximately 10.1% to the national Gross Domestic Profit (GDP), only behind Tshwane (11% country GDP) and Johannesburg (15% of country's GDP) (IDP, 2022/2023).

The municipality is divided into four spatial regions (**Figure 6-6** -); North, Central, South and Outer West, and represents 33% (1.15 million people), 34% (1.18 million people), 23% (760 000) and 11% (330 000) respectively (IDP, 2022/2023).

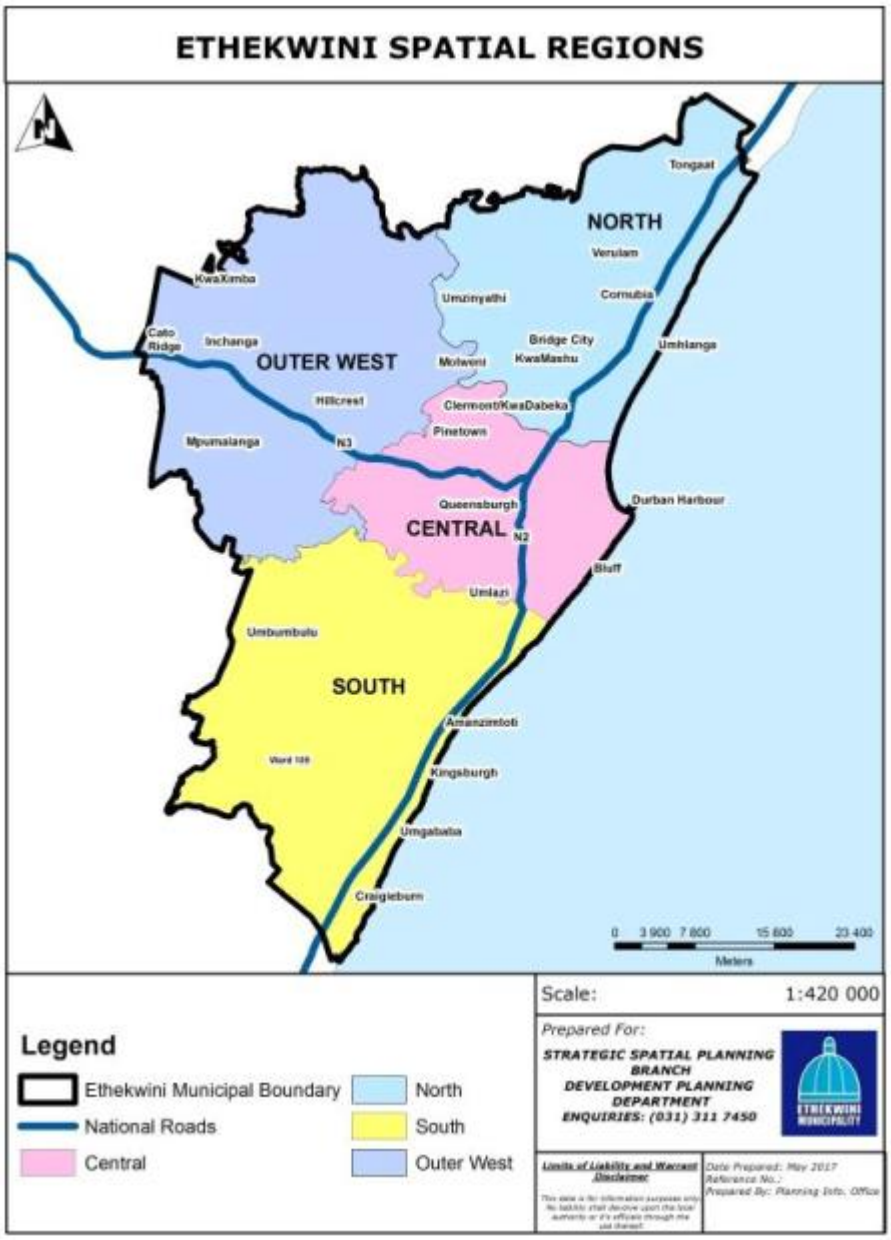


Figure 6-6 - eThekwini Spatial Regions (Source: Development, Planning, Environment & Management Unit; eThekwini Municipality)

The municipality accommodated a wide range of land uses including, formal, informal, urban and rural settlements, economic, transport, public and social infrastructure, agriculture and traditional settlement, and metropolitan open space systems (IDP, 2022/2023). About 68% of the municipality is considered rural, comprising of commercial farms and metropolitan open space (10% land extent), and geospatial features (hilly, rugged terrain, dispersed settlement, traditional dwellings and communal land under the Ingonyama Trust, encompassing 90% of rural land). The remaining 32% of land is dominated by residential, commercial and industrial land uses (MSDF, 2022/2023).

The Port of Durban employees approximately 5 000 people, with 1 000 business directly related to the port operations (IDP, 2022/2023). the ports main exports include iron and steel products, chemicals and vehicles. During 2018 – 2020, imports averaged approximately 1 180 000 Twenty-foot Equivalent Unit's (TEU's), exported approximately 1 170 000 and performed 380 000 transhipments (IDP, 2022/2023). The ports import and export activities have declined since the Covid-19 restrictions, and is estimated that the is only operation at 60% capacity at the end of 2021.

The eThekwini Municipality consists of a diverse society, which faces a variety of social, economic, environmental and governance challenges. eThekwini is characterised as having a growing economy and is the primary economic contributor (65.5%) to KZN's Gross Domestic Product (GDP). The eThekwini economy grew by 0.9% in 2016. eThekwini's economy is dominated by tertiary industries including contributions from the finance (20%), manufacturing (19%), community services (20%), trade (18%) transport (14%) and construction (5%) sectors. The production of fuel and petroleum are significant contributors to the manufacturing sector in the municipality (eThekwini, May 2012).

The eThekwini Municipality is bordered by iLembe district municipality to the north, Ugu district municipality to the south, and uMgungundlovu to the west, **Figure 6-7**.

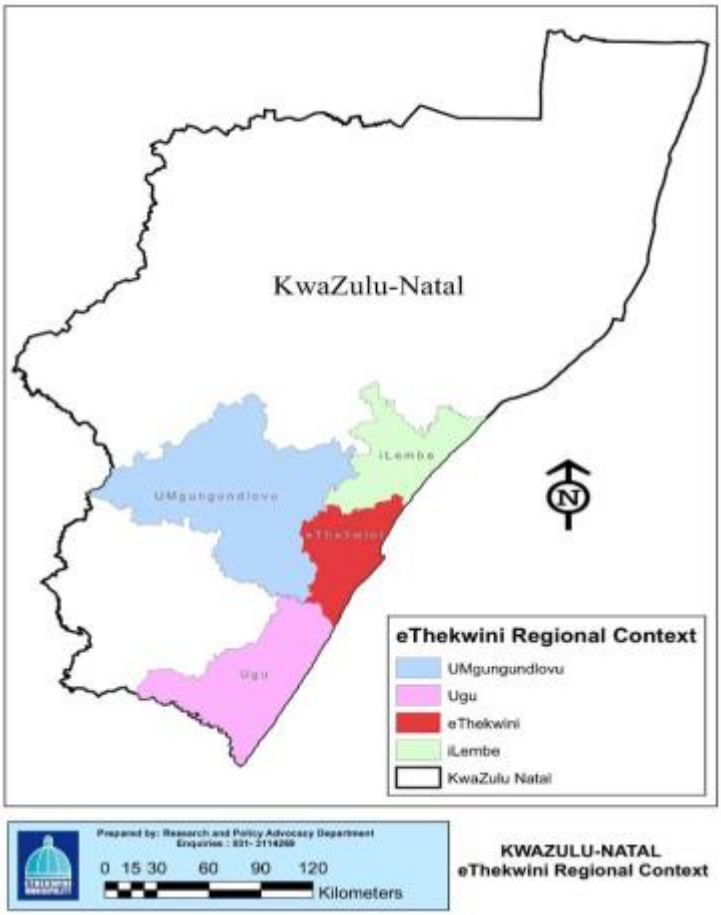


Figure 6-7 - eThekwini Municipality in regional Context (source: eThekwini MSDF 2022-2023)

6.3.3 ARCHAEOLOGICAL AND CULTURAL HERITAGE

Due to the disturbed and transformed nature of the area where the proposed tank expansion is to be constructed, it is highly unlikely that intact heritage resources will be found on the site. Continual urban and industrial development of the area over many decades has resulted in a highly disturbed environment.

The KwaZulu-Natal Amafa and Research Institute had issued a demolition permit and graded the site “Not Conservation Worthy”.

6.4 TRAFFIC

*This section is supplemented with information from the Traffic Impact Assessment (NAKO SYSTRA (Pty) Ltd, 2023) and included in **Appendix G.2** of this BAR.*

6.4.1 BACKGROUND

The Traffic Impact Assessment (TIA) is an update of the previous TIA undertaken by ILISO Consulting (Pty Ltd in October 2015 for the previous developers, Oiltanking Grindrod Calulo Terminals (Pty) Ltd (OTGC).

Objectives

The objectives of the TIA were to assess the impact of the proposed storage tank expansion development on the adjacent road network and if necessary to evolve appropriate mitigating measures that would be required to meet the anticipated traffic demand, under various scenarios.

6.4.2 STUDY AREA

In general, the scope of traffic studies is limited to intersections (and road networks) that will be affected significantly, due to the development-generated traffic. It is common cause that the traffic impacts of new developments are concentrated on the immediate transportation network with these impacts dissipating further away from the development as more access opportunities become available and traffic disperses onto the broader road network.

The proposed development is not anticipated to generate more than 50 trips in the peak hours. However, due to the sensitivity of the road network in the Port of Durban area and the high traffic volumes of heavy vehicles that traverse the adjacent roadways, the intersections that were considered most appropriate to analyse was limited on the key focus of the following intersections:

- Maydon Road with Margaret Mncadi Road (1),
- Maydon Road with Rick Turner Road / Shadwell Road / Wisely Road (2),
- Rick Turner road with Sydney Road (3), and
- Rick Turner Road with Umbilo Road (4).

The study area is illustrated at **Figure 6-8.**

Figure 6-8 – Extent of Study Area showing intersections analysed.

6.4.3 2023 Base-Year Road Network

According to the Road Infrastructure Strategic Framework for South Africa (RIFSA) classification of the road network within the study area constitutes of Class 2, 3 and 4 roads.

Table 6-5 lists the roads relevant to this traffic study with its key transport information.

Table 6-5 – Road Characteristics

Name of Road	Class	Owner	No. of Lanes	Lane Width (m)	Sidewalks	Public Transport	Road Condition
Margaret Mncadi Avenue	CL 2	eThekwini	6 lane, dual carriageway	3.5 wide	On both the edges > 1.5m	Yes	Satisfactory
Sydney Road	CL 2	eThekwini	5 lane, one-way	3.0 wide	On both the edges > 1.5m	Yes	Satisfactory
Rick Turner Road	CL 2	eThekwini	4 lane, dual carriageway	3.5 wide	On both the edges > 1.5m	Yes	Satisfactory

Umbilo Road	CL 3	eThekwini	3 lane, one-way	3.5 wide	On both the edges > 1.5m	Yes	Satisfactory
Maydon Road	CL 3	eThekwini	2 lane, two-way	3.0 wide	On both the edges > 1.5m	Yes	Fair
Wisely Road	CL 3	eThekwini	2 lane, two-way	3.5 wide	On both the edges > 1.5m	Yes	Fair
Shadwell Road	CL 4	eThekwini	2 lane, two-way	6.5 wide	No sidewalks	No	Fair

Intersections analysed are indicated in **Figure 6-9** below.

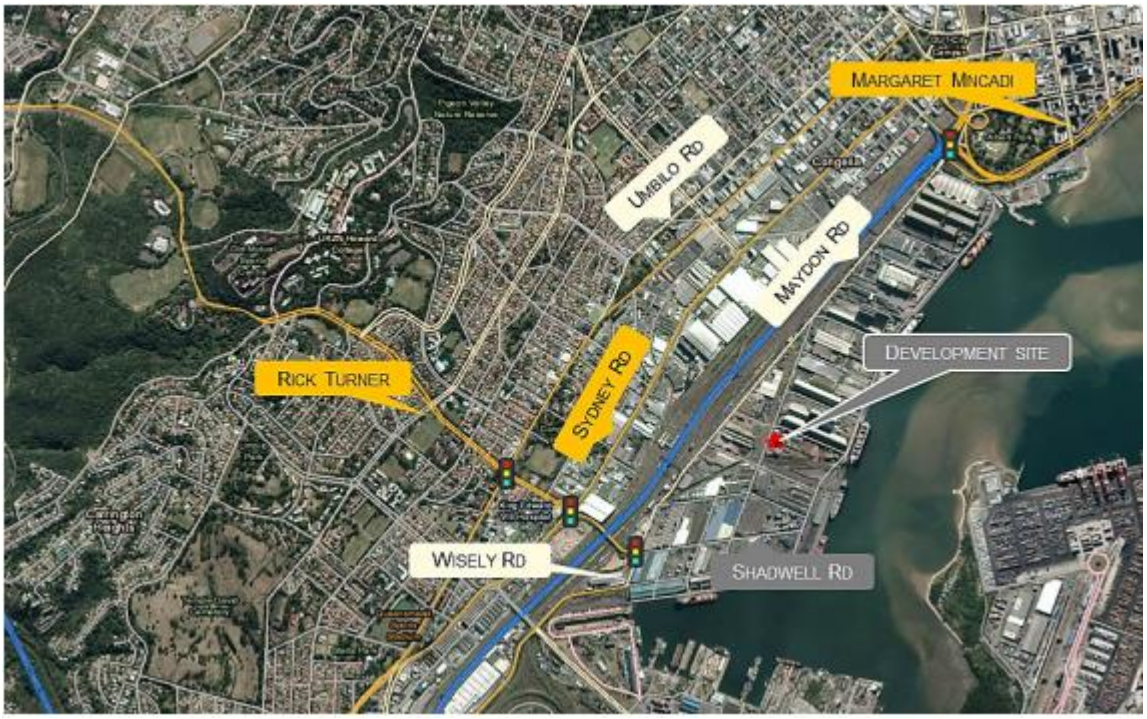


Figure 6-9 – Intersections analysed, indicated with a traffic light

6.4.4 Planning

The eThekwini Municipality and TRANSNET are currently in the process of reviewing the Port of Durban footprint, expansion plans and the transportation network to service the Port. However, this is in the early stages of conceptualisation, and it is unlikely that any planned changes or upgrades to the transportation network would be implemented in the area during the horizon period for which this traffic assessment has been undertaken.

6.4.5 Background Traffic Volumes

Traffic counts were utilised to determine the travel characteristics and level of service at the affected intersections within the study area. Classified manual traffic counts were undertaken on Wednesday, 29 March 2023, from 06h00 to 18h00. The traffic count data is given in **Appendix G.2**.

The traffic counts were undertaken at the affected intersections of:

- Maydon Road with Margaret Mncadi Road (1),
- Maydon Road with Rick Turner Road / Shadwell Road / Wisely Road (2),
- Rick Turner road with Sydney Road (3), and
- Rick Turner Road with Umbilo Road (4).

From these traffic counts, the Weekday morning and afternoon peak hours within the study area were determined to be:

- Weekday AM peak hour 07h15 to 08h15
- Weekday PM peak hour 16h00 to 17h00

The traffic counts were used to determine the current levels of service at the affected intersections within the study area.

The 2023 Weekday morning and afternoon peak hour background traffic counts are shown in **Figure 6-10**.

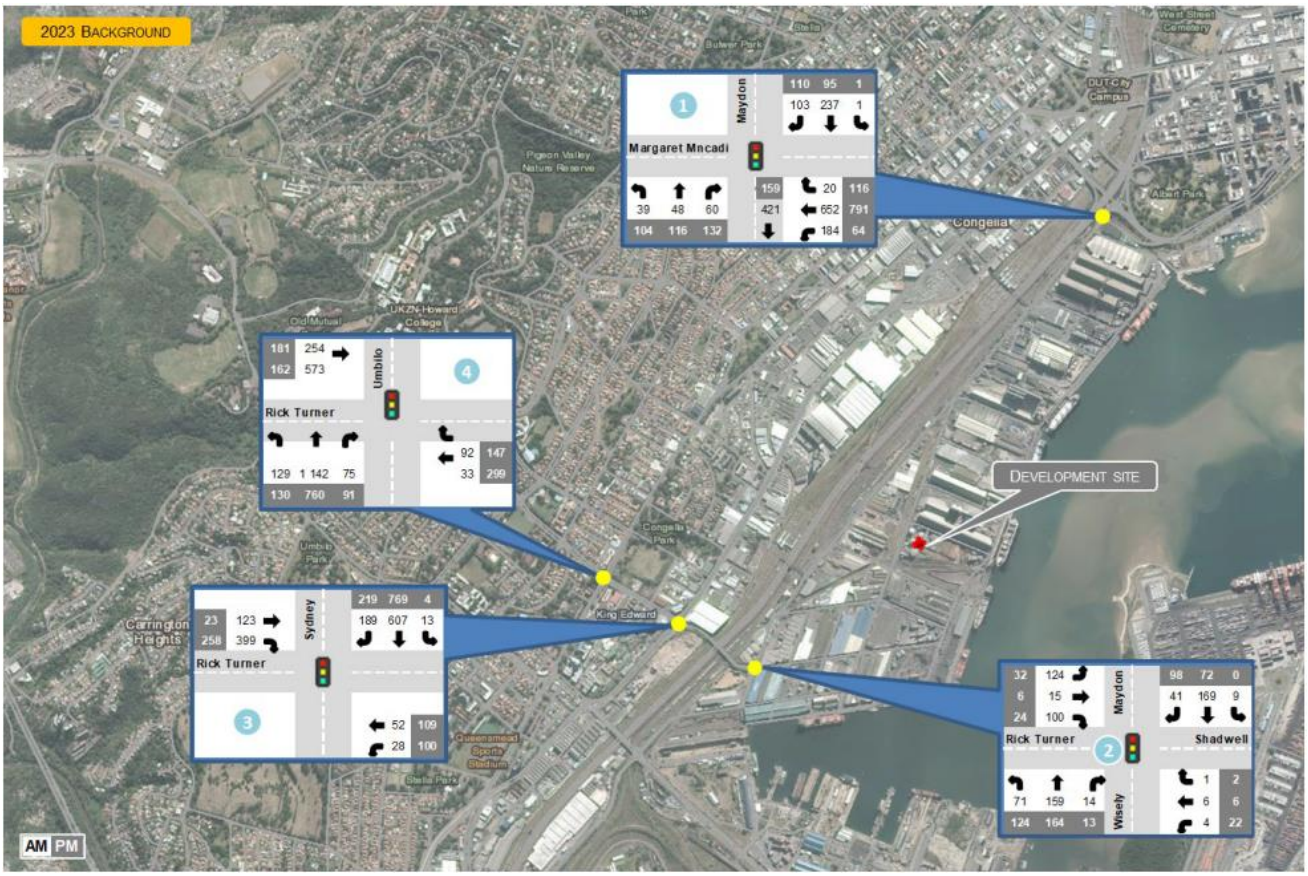


Figure 6-10 – 2023 Weekday AM and PM Peak Hour Background Volumes

6.4.6 Growth In Background Traffic Volumes

Traffic counts undertaken in November 2014 at the Maydon Road / Shadwell Road / Wisely Road / Rick Turner Road intersection revealed that 1 606 and 1 238 vehicles traversed this intersection in the Weekday morning and afternoon peak hours, respectively. However, current traffic volumes surveyed in March 2023 revealed that 727 and 583 vehicles traversed this intersection in the Weekday morning and afternoon peak hours, implying a negative growth rate of approximately 8% pa.

However, for the purposes of this study, and in the context of potential changes to the surrounding land-use development as a result of the Port expansion, it was assumed that a growth rate of 2% will be applicable for traffic growth on the adjacent road network, which is in keeping with the growth rate applied by the eThekwini Transport Authority.

Accordingly, the 2023 Weekday morning and afternoon peak hour background traffic counts were escalated at this assumed rate to determine the 2028 peak hour background traffic counts. The 2028 background traffic counts are shown in **Figure 6-11**.

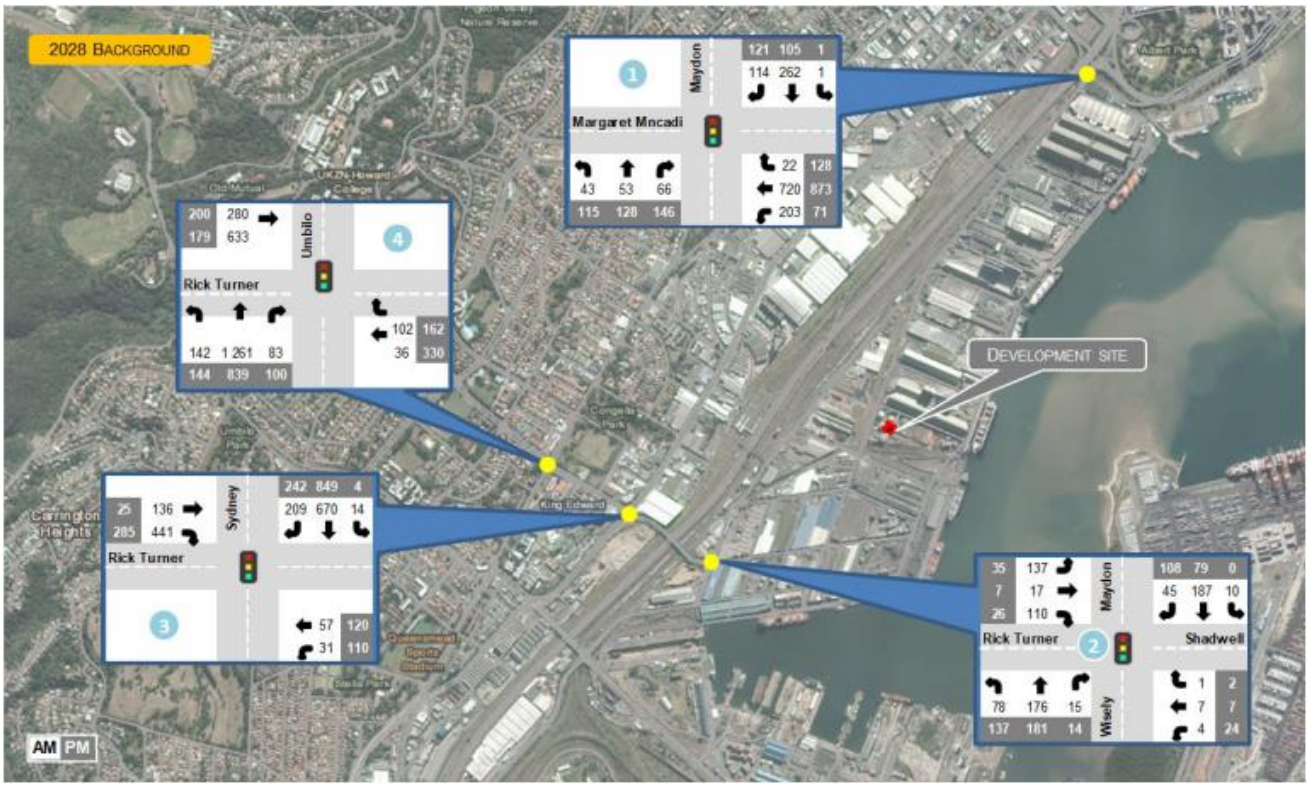


Figure 6-11 – 2028 Weekday AM and PM Peak Hour Background Volumes

6.4.7 Assessment Hours

Based on the proposed land use development, and the nature of traffic flow in the area, both the Weekday morning and afternoon peak periods have been investigated.

6.4.8 Assessment Years

In terms of the eThekwini Transport Authority's TIA Guidelines, any development generating trips up to 1 000 peak hour trips will require a 5-year horizon to be assessed.

6.4.9 Scenarios

Four scenarios have been analysed in this study, namely:

- Scenario 1: Base year (2023) AM Background + Proposed development traffic
- Scenario 2: Base year (2023) PM Background + Proposed development traffic
- Scenario 3: Horizon year (2028) AM Background + Proposed development traffic
- Scenario 4: Horizon year (2028) PM Background + Proposed development traffic

6.4.10 Trip Generation

The document “Manual for Traffic Impact Assessments and Site Traffic Assessment, Version 0.1, October 2015” (herein referred to as the Manual) published by the eThekwini Transport Authority (ETA) is silent for a petrochemical industrial land use such as a new liquid bulk fuel tank farm.

Based on the information provided by the Client, the proposed development is anticipated to generate an additional 60 heavy vehicle trips within the 24-hour period on the adjacent road network.

Consequently, the 24 hour volume was converted using the following assumptions to estimate the development generated Heavy Goods Vehicle (HGV) trips in the peak hour:

- 24 Hr : 12Hr conversion = 1.2 (EM standard)
- A heavy goods vehicle (HGV) analysis was undertaken at the intersections of Maydon Road Margaret Mncadi Avenue (intersection 1) and Maydon Road / Rick Turner Road / Shadwell Road (intersection 2). The HGV analyses showed that, as a worst-case scenario, the highest HGV percentage in an hour at intersections 1 and 2 were 13.7% and 11.4%, respectively. Thus, the higher percentage (13.7%) was used to convert the 12-Hour HGV trips to estimate the peak hour HGV trips.
- Employing the abovementioned assumptions 7 HGV trips were estimated in the peak hour.
- Using a passenger car unit (PCU) factor of 5, this equates to 35 PCU’s in the peak hour.

It was assumed that the heavy vehicles would enter / exit the development site in the same peak hour having a split 50% in : 50% out.

Hence, the proposed development is expected to generate a total of 35 new PCU trips (used in the analyses) on the immediate surrounding road network during the Weekday morning and afternoon peak hours with 18 in : 17 out.

6.4.11 Analysis Information: Traffic Volumes

The total traffic demand for the base year (2023) and horizon year (2028) are depicted in **Figure 6-12** and **Figure 6-13** below (for the respective sensitivity scenarios).

2023:

- Scenario 1: 2023 Base year AM Background + Proposed development traffic;
- Scenario 2: 2023 Base year PM Background + Proposed development traffic.

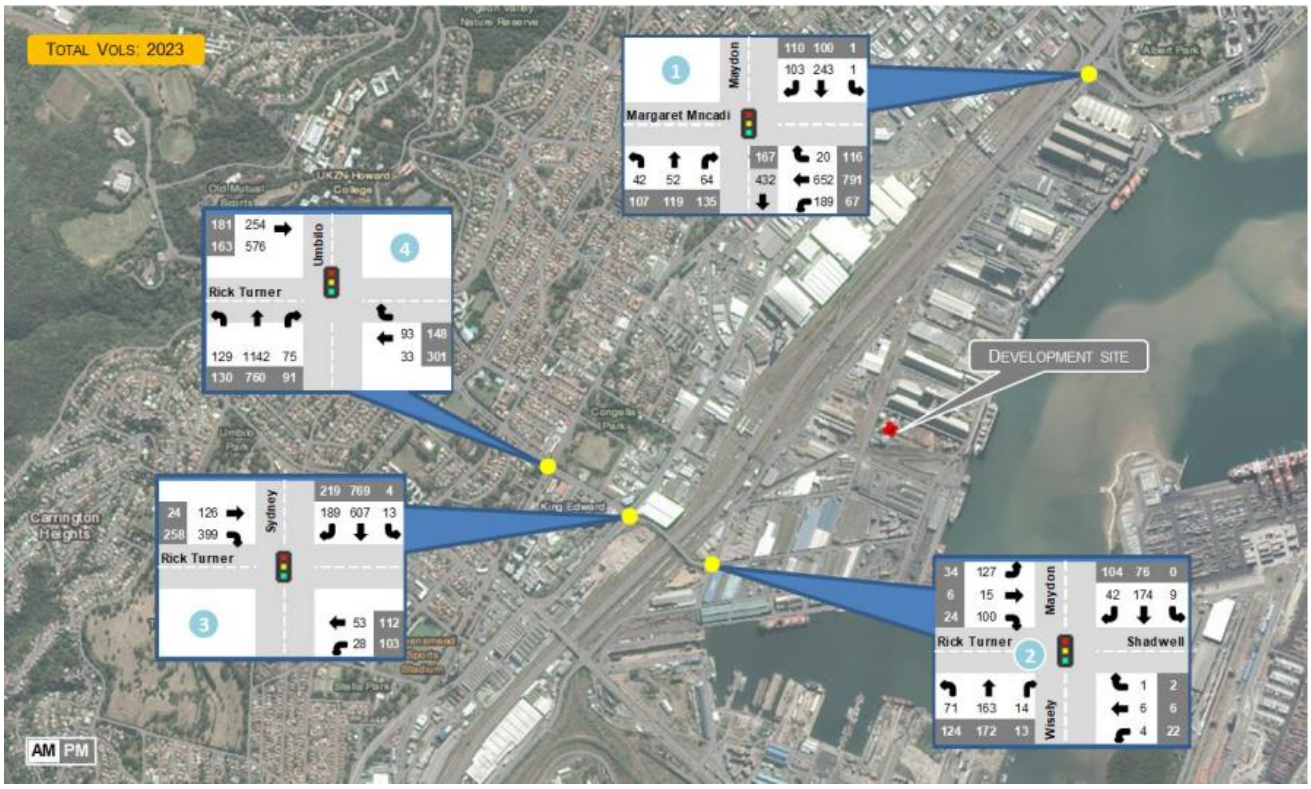


Figure 6-12 – 2023 Base year with proposed development traffic, AM and PM

2028:

- Scenario 3: 2028 Horizon year AM Background + Proposed development traffic;
- Scenario 4: 2028 Horizon year PM Background + Proposed development traffic

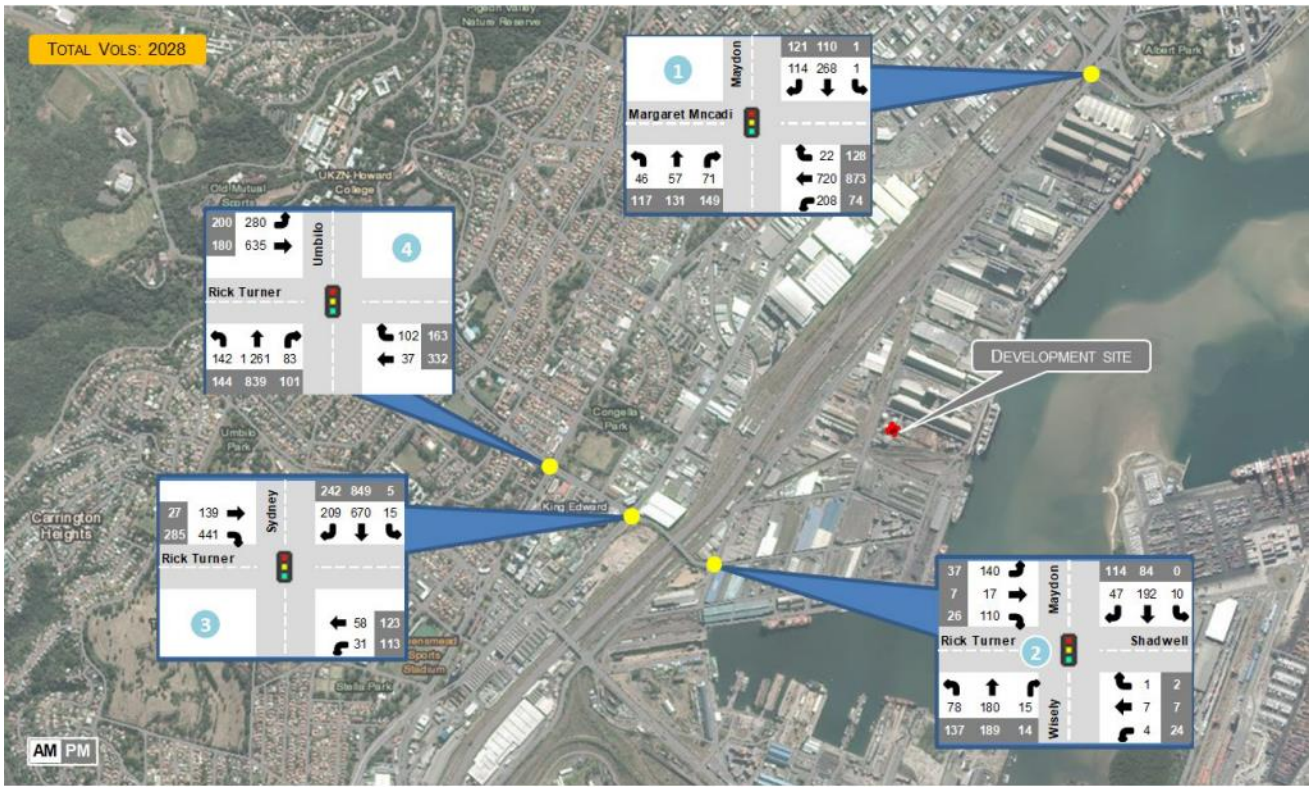


Figure 6-13 – 2023 Base year with proposed development traffic, AM and PM

6.5 MAJOR HAZARD INSTALLATION

*This section is supplemented with information from the Major Hazard Installation Assessment (iSHEcon, 2023) and included in **Appendix G.3** of this BAR.*

6.5.1 NOTIFICATION OF MAJOR HAZARD INSTALLATION

As this establishment is a Major Hazard, notifications are required. Refer to regulation 4 of the Major Hazard Installation Regulations of the Occupational Health and Safety Act 85/1993, as amended.

The installations must be re-assessed within five years. Refer to regulation 10 of the Major Hazard Installation Regulations of the Occupational Health and Safety Act 85/1993, as amended. Regulation 10 also stipulates the circumstances under which the risk assessment should be reviewed before the 5-year period.

6.5.2 REPORTING OF EMERGENCY OCCURRENCES

In terms of regulation 16 of the Major Hazard Installation Regulations of the Occupational Health and Safety Act 85/1993, as amended all incidents on the installations, which require the emergency procedures to be activated, must be reported to the local emergency services as well as to the Provincial and National authorities.

Such incidents must be recorded, and the register must be available at the site for inspection.

6.5.3 CLASSIFICATION

The site was classified as a medium hazard Major Hazard Establishment based on the following bulk quantities of hazardous materials at this site which have the potential to cause major hazard incidents should significant failures take place:

- Base Oil - fire radiation
- Bitumen - fire radiation
- Diethylene Glycol - fire radiation
- Heavy Fuel Oil - fire radiation
- Illuminated Paraffin - fire radiation and explosion overpressure
- Mono Ethylene Glycol - fire radiation
- Residual Fuel Oil - fire radiation
- Slack Wax (paraffinic hydrocarbons) - fire radiation

6.5.4 DESCRIPTION OF SITE AND SURROUNDINGS

Figure 6-14 – FFS Tank Terminals Maydon Wharf site and surrounding area

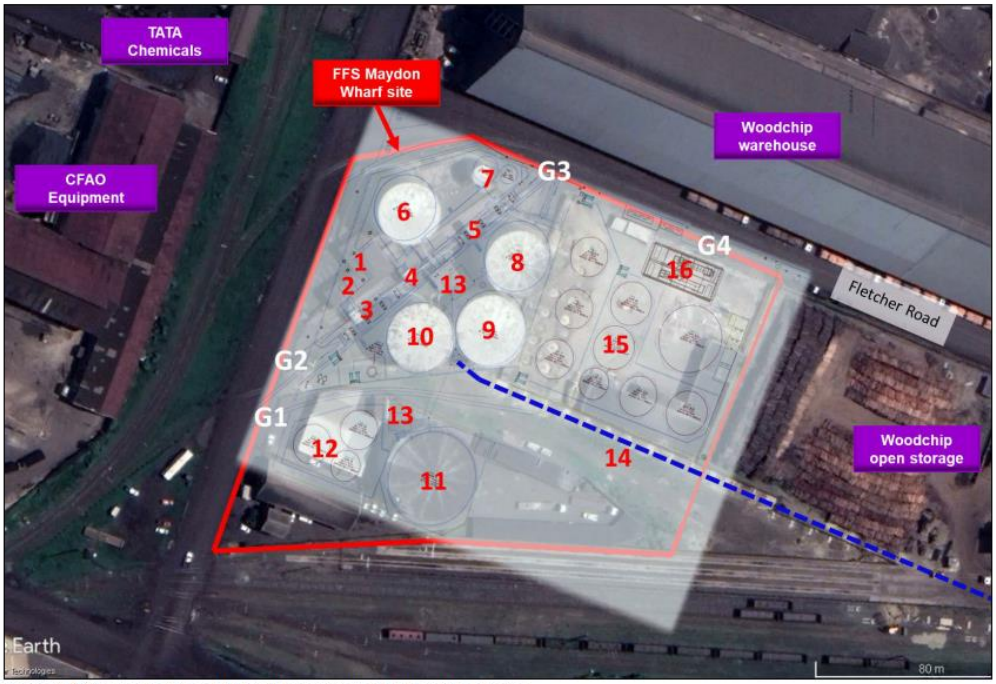


Figure 2.1.3 Layout of the FFS Tank Terminals Maydon Wharf site

1.	Office block - MOB*
2.	Control room
3.	Gantry 2
4.	Weighbridge
5.	Gantry 1
6.	MEG tank 5
7.	DEG tanks 6 & 7
8.	HFO/RFO tank 2
9.	MEG tank 1
10.	HFO/RFO tank 3
11.	HFO/RFO tank 4
12.	Base Oil / Slack wax x3 tanks
13.	Pumphouses
14.	Ship pipeline route
15.	Bitumen new tanks x9 tanks
16.	Bitumen gantry
- -	Transfer pipeline from berth
G1	Tank 4 entrance gate
G2	Tanker exit gate
G3	Tanker entrance gate
G4	New site main gate
MOB*	Main Occupied building

Figure 6-15 – Layout of the FFS Tank Terminals Maydon Wharf site

In **Figure 6-15** above, the border of FFS Tank Terminals Maydon Wharf site (defined as the potential Major Hazard Installation Premises) is marked in red. All persons outside this area are considered to be members of the public.

Table 6-6 below indicates the nearby locations relevant to the MHI study.

Table 6-6 – Nearby Locations

Location	Details	Approximate Distance from site boundary (m)
Neighbouring sites	E: NCT Durban Woodchips N: NCT Durban Woodchips warehouse W: CFAO Equipment, TATA Chemicals S: Omnia fertilizer	
Nearby MHIs and possible MHIs	TNPA berths	130 m East
Closest residential area		1 km East
Busy main roads, highways or rail lines	M4 Rail tracks	370 m West 290 m West and 20 m South

Sensitive receptors	Clinic	1 km South West
Other	UKZN	1.4 km South West

6.5.5 MATERIAL HAZARDS

The materials on the site were categorised according to SANS 10228 classes of dangerous substances, as detailed below in **Table 6-7** to determine whether these materials constitute an MHI risk that needs further quantification.

Table 6-7 – Summary of Hazardous Material Inventories

Material	Cas Number (UN Number)	Sans10228 Classification	Sans 10234 GHS Categories	Maximum Inventory (T)	Maximum Single Storage (T)	Annual Through-Put (T)
Base Oil / Slack wax	64742-54-7 (3257)	3 Flammable liquids	H226 Flam. Liq. 3	5 525	2 125	7 800
Bitumen	8052-42-4 (1993)	3 Flammable liquids	H226 Flam. Liq. 3	27 750	7 250	109 200
Diethylene Glycol	111-46-6 (3082)	3 Flammable liquids	H226 Flam. Liq. 3	790	471	744
HFO / RFO	68476-33-5 (1268)	3 Flammable liquids	H226 Flam. Liq. 3	23 185	10 675	46 800
Mono Ethylene Glycol	107-21-1 (3082)	3 Flammable liquids	H226 Flam. Liq. 3	14 900	7 602	62 300
Paraffin	8008-20-6 (1223)	3 Flammable liquids	H226 Flam. Liq. 3	62	62	380

Additional materials on the FFS Tank Terminals site:

- Cleaning agents
- Paint and paint related products
- Liquid solvents

These materials are stored or kept in small quantities on site in chemical stores and gas cages, or have a low hazard potential and are therefore not considered further as sources of major hazards.

6.5.6 HAZARDOUS MATERIAL INTERACTIONS

Some hazardous chemicals, when mixed, may result in flammable, explosive or toxic effects.

Only hydrocarbon liquids will be stored and handled on the FFS Tank Terminals site. These materials can be mixed without hazardous effects and will only degrade the quality of the material for the intended use.

Interaction consequences for any of the combinations above are not expected to cause catastrophic MHI events and are therefore not considered further in the MHI assessment.

6.5.7 PATHWAYS TO MAJOR HAZARD EVENTS

6.5.7.1 Base Oil

Hazards: ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

Loss of Containment (LOC) events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire / Flash fire / Vapour cloud explosion

6.5.7.2 Bitumen

Hazards: Ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

LOC events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire / Vapour cloud explosion

6.5.7.3 Diethylene Glycol

Hazards: Ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

LOC events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire

6.5.7.4 Heavy fuel oil

Hazards: Ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

LOC events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire / Flash fire / Vapour cloud explosion

6.5.7.5 Monoethylene Glycol

Hazards: Ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

LOC events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire

6.5.7.6 Paraffin

Hazards: Bulk tank storage, pipe transfer, road tanker offloading

Main characteristics:

- Combustible liquid.

LOC events:

- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak.
- Loading pipe – full bore rupture or leak
- Offload hose – full bore rupture or leak

LOC + Ignition event = Pool fire / Flash fire / Vapour cloud explosion

6.5.7.7 Residual fuel oil

Hazards: Ship hose transfer, pipeline transfer, bulk tank storage, road tanker loading

Main characteristics:

- Combustible liquid.

LOC events:

- Ship hose and transfer pipeline – full bore rupture or leak.
- Bulk vessel – catastrophic rupture, large leak, small leak, overfill.
- Vessel piping – full bore rupture or leak.
- Loading pipe – full bore rupture or leak.
- Road tanker vessel – catastrophic rupture, large leak, small leak, overfill.

LOC + Ignition event = Pool fire / Flash fire / Vapour cloud explosion

6.5.8 GENERAL SAFETY MEASURES IN PLACE

- Scheduled maintenance
- Emergency planning and response and maintained equipment
- Firefighting equipment – fire extinguishers, hose reels, foam monitors – maintenance up to date
- Statutory inspections
- Electrical Certificate of Compliance
- Trained and competent personnel
- Written and document-controlled procedures
- Design, construction and construction materials as per industry standards

A bow-tie analysis was undertaken to identify the failure events, their causes, consequences, as well as the preventative and mitigative measures in place on the installation.

7 SITE SENSITIVITY VERIFICATION

7.1 AGRICULTURAL POTENTIAL

The purpose of including an agricultural component in the environmental assessment process is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security. The different categories of agricultural sensitivity, used in the national web-based environmental screening tool, indicate the priority by which land should be conserved as agricultural production land.

Agricultural sensitivity is a direct function of the capability of the land for agricultural production. All arable land that can support viable crop production, is classified as high (or very high) sensitivity. This is because there is a scarcity of arable production land in South Africa and its conservation for agricultural use is therefore a priority. Land which cannot support viable crop production is much less of a priority to conserve for agricultural use and is rated as medium or low agricultural sensitivity.

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not. All cropland is classified as at least high sensitivity, based on the logic that if it is under crop production, it is indeed suitable for it, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. Land capability is defined as the combination of soil, climate, and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land, based on its soil, climate, and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

A map of the proposed FFS TT development area overlaid on the screening tool sensitivity is given in **Figure 7-1**. The classification of the site as high agricultural sensitivity is because that land is classified as cropland in the data set used by the screening tool. However, that data set is outdated.

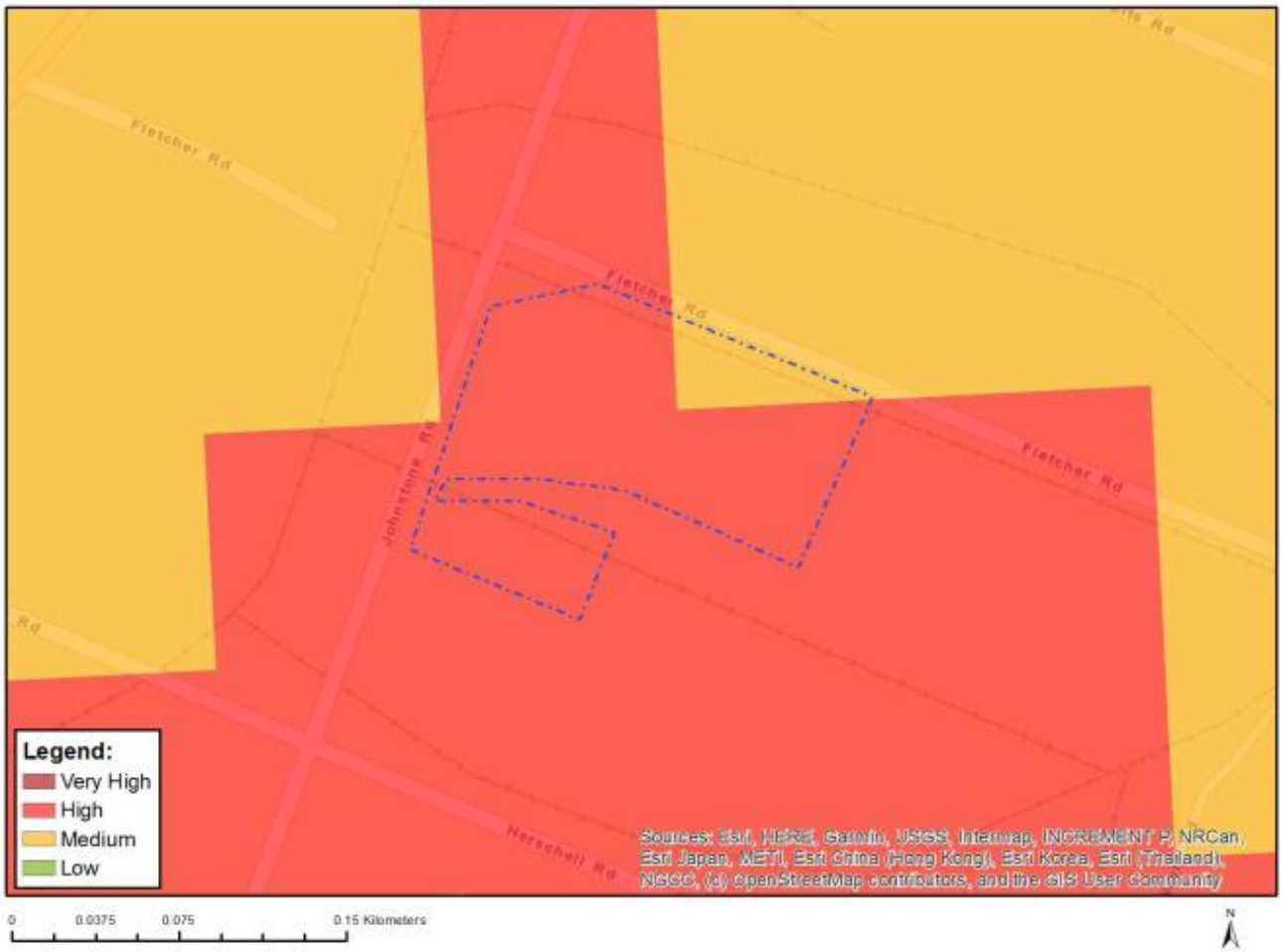


Figure 7-1 - Map of Agriculture Sensitivity

Source: DFFE Screening Report

The DFFE screening tool identifies the agricultural sensitivity as high, however, a site visit was conducted on 31 January 2023, confirming the development footprint and surrounding areas to be completely transformed due to industrial activities operating at the Maydon Wharf precinct, Port of Durban therefore the EAP refutes the high sensitivity rating and considers the site to be of low sensitivity for the agricultural theme

7.2 ARCHAEOLGICAL AND CULTURAL HERITAGE

The DFFE Screening Tool indicates that the Proposed Project falls within an area of Very High Sensitivity for the Archaeological and Cultural Heritage Theme (**Figure 7-2**). The site verification conducted on 31 January 2023 confirming the low sensitivity of the project footprint as it has been completely transformed. The project footprint is industrialised and hard standing, surrounded by other industrial harbour companies with limited to no potential of sustaining healthy indigenous vegetation due to the absence of green zones.

Due to the disturbed and transformed nature of the area where the proposed tank expansion is to be constructed, it is highly unlikely that intact heritage resources will be found on the site. Continual urban and industrial development of the area over many decades has resulted in a highly disturbed environment.

The KwaZulu-Natal Amafa and Research Institute had issued a demolition permit, and graded the site “Not Conservation Worthy”, see **Appendix F**.

Figure 7-2 - Map of Archaeological and Cultural Heritage Sensitivity

Source: DFFE Screening Report

7.3 PALAEONTOLOGY

The DFFE Screening Tool indicates that the Proposed Project falls within an area of Low Sensitivity for the Palaeontology Theme (**Figure 7-3**). The site verification conducted on 31 January 2023 confirming the low sensitivity of the project footprint as it has been completely transformed. The project footprint is industrialised and hard standing, surrounded by other industrial harbour companies.

Due to the disturbed and transformed nature of the area where the proposed tank expansion is to be constructed, it is highly unlikely that palaeontology resources will be found on the site. Continual urban and industrial development of the area over many decades has resulted in a highly disturbed environment.

The KwaZulu-Natal Amafa and Research Institute had issued a demolition permit, and graded the site “Not Conservation Worthy”, see **Appendix F**.

Figure 7-3 - Map of Palaeontology Sensitivity

Source: DFFE Screening Report

7.4 TERRESTRIAL BIODIVERSITY

The DFFE Screening Tool indicates that the Proposed Project falls within an area of High Sensitivity for the Terrestrial Biodiversity Theme (**Figure 7-4**). The site verification conducted on 31 January 2023 confirming a low sensitivity of the project footprint as it has been completely transformed. The project footprint is industrialised and hard standing, surrounded by other industrial harbour companies with limited to no potential of sustaining healthy indigenous terrestrial biodiversity due to the absence of green zones and natural habitats.

Due to the disturbed and transformed nature of the area where the proposed tank expansion is to be constructed, it is highly unlikely that a healthy a terrestrial biodiversity population will be found on the site. Continual urban and industrial development of the area over many decades has resulted in a highly disturbed environment.

Figure 7-4 - Map of Terrestrial Biodiversity Sensitivity

Source: DFFE Screening Report

7.4.1 PLANT SPECIES

The DFFE Screening Tool indicates that the Proposed Project falls within an area of Low Sensitivity for the Plant Species Theme (**Figure 7-5**). The site verification conducted on 31 January 2023 confirming the low sensitivity of the project footprint as it has been completely transformed. The project footprint is industrialised and hard standing, surrounded by other industrial harbour companies with limited to no potential of sustaining healthy indigenous vegetation due to the absence of green zones.

Figure 7-5 - Map of Plant Species Sensitivity

Source: DFFE Screening Report

7.4.2 ANIMAL SPECIES

The DFFE Screening Tool indicates that the Proposed Project has a High sensitivity, although the site predominantly falls within a Medium sensitivity area (**Figure 7-6**). The High sensitivity features include the potential presence of avifaunal species; *Hydroprogne caspia*, *Pelecanus onocrotalus, Pelecanus rufescens* and *Mycteria ibis,* however all of which being listed of Least Concern under the IUCN Red List of Threatened Species (2016). The Medium sensitivity features include the potential presence of avifaunal species; *Podica senegalensis* and *Stephanoaetus coronatus*, mammalian species; *Chrysospalax villosus,* and invertebrate species; *Arytropteris basalis, Pomatonota dregii, Phymeurus illepidus* and *Doratogonus rubipodus*.

The site verification indicates that there is no suitable habitat for these species within the project footprint indicating that the site can be considered low sensitivity.

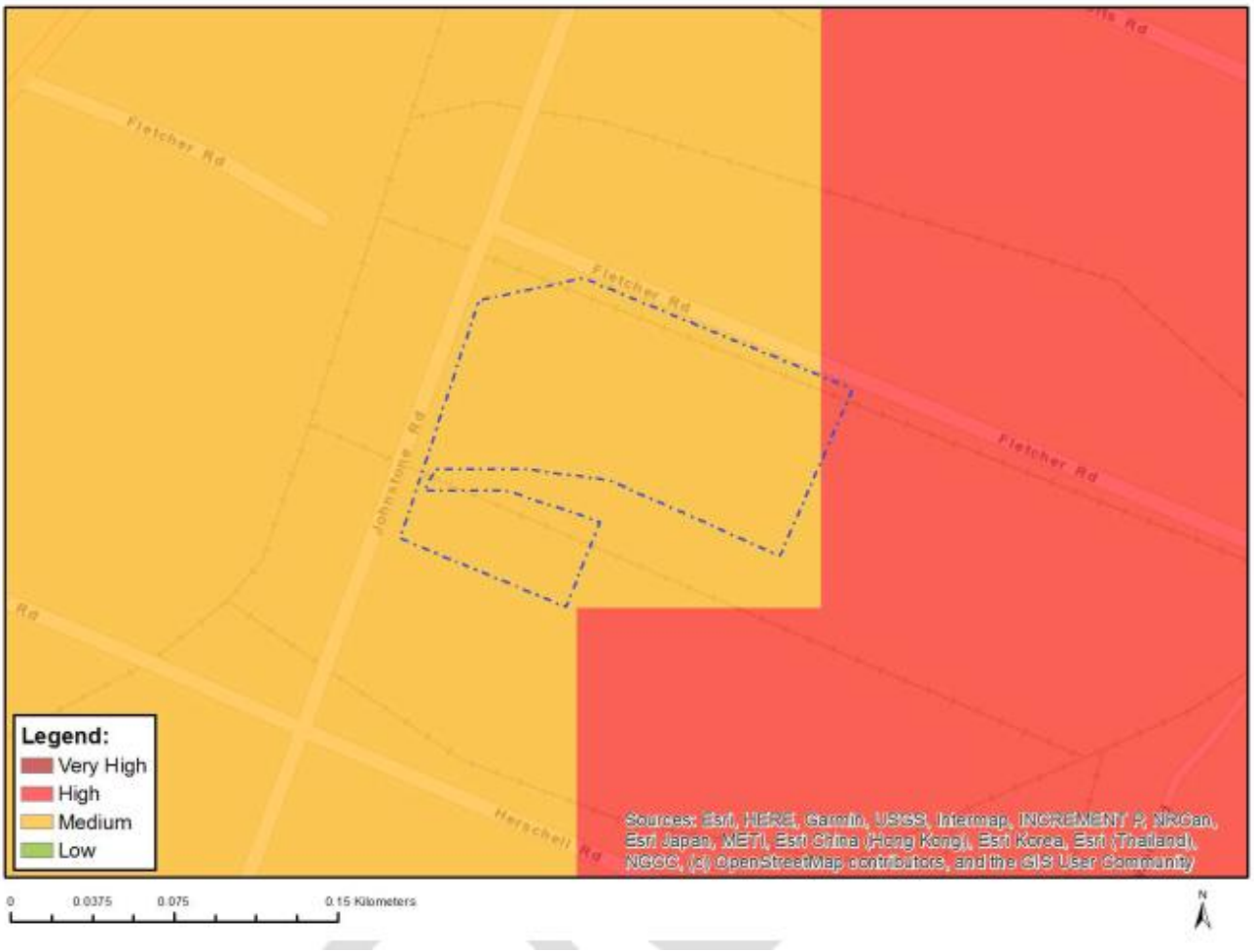


Figure 7-6 - Map of Animal Species Sensitivity

Source: DFFE Screening Report

7.5 AQUATIC BIODIVERSITY

7.5.1 AQUATIC BIODIVERSITY

The DFFE Screening Tool indicates that the Proposed Project has a Very High sensitivity for the Aquatic Biodiversity Theme (**Figure 7-7**). This is due to the facility being located within a 500 m radius to the Durban Bay Estuarine Functional Zone, which has already been largely impacted by industrial developments and activities due to the Port of Durban operations.

Despite the site being considered very high sensitivity for the aquatic theme, the proposed expansion will not have any impact on the aquatic biodiversity.

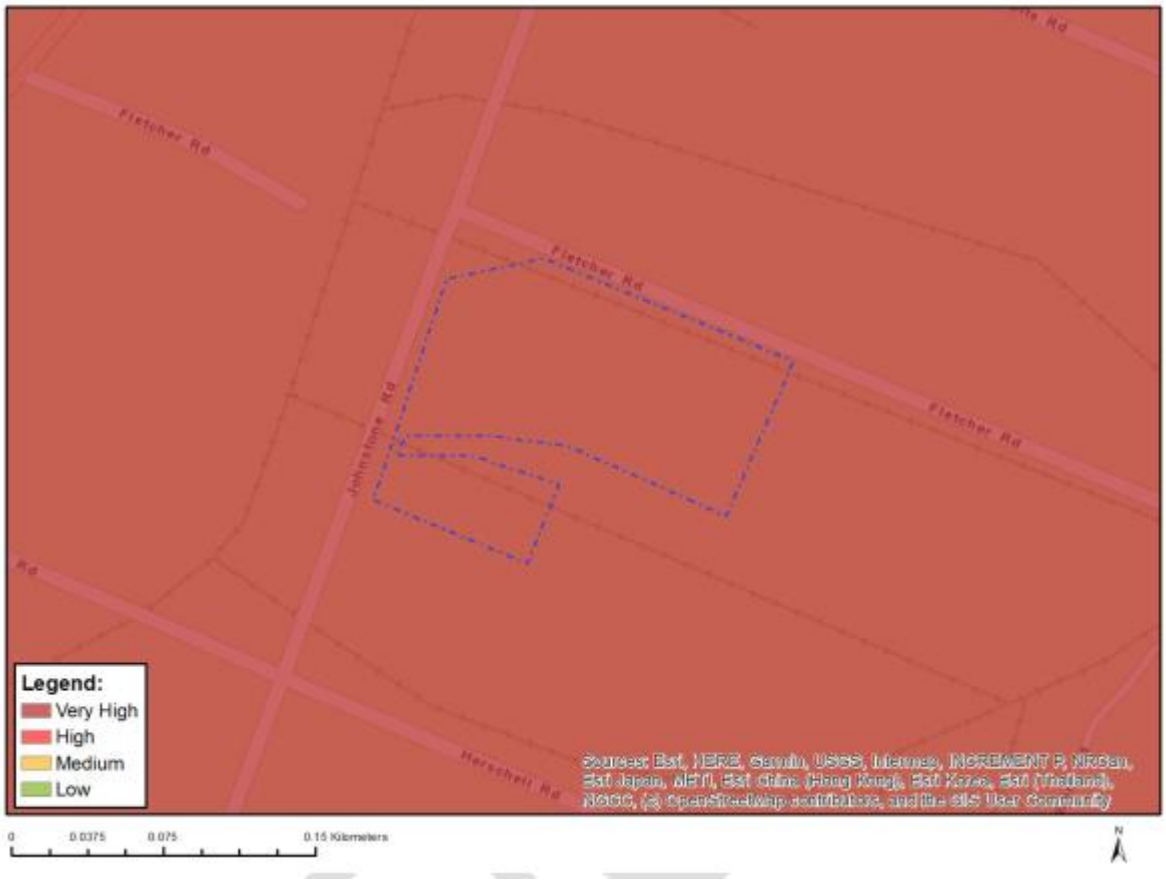


Figure 7-7 - Map of Aquatic Biodiversity Sensitivity

Source: DFFE Screening Report

7.6 CIVIL AVIATION THEME

Figure 7-8 below indicates that the Proposed Project is rated as High sensitivity by the DFFE Screening Tool. The classification of the site as high sensitivity is due the Proposed Project being located within 15 km from a civil aviation radar, between 15 to 35 km from a major civil aviation aerodrome and between 8 to 15 km from a other civil aviation aerodrome. However due to the nature and location of the Proposed Project, the sensitivity is regarded as low.

Air Traffic Navigation Services (ATNS) and South African Civil Aviation Authority (SACAA) will be included in the project stakeholder database. They will be informed of the Proposed Project, and comment will be sought from these authorities as applicable.

Figure 7-8 - Map of Civil Aviation Sensitivity

Source: DFFE Screening Report

7.7 DEFENCE THEME

As indicated in **Figure 7-9** below indicates that the Proposed Project is rated as Medium sensitivity by the DFFE Screening Tool. No further assessment were required, as indicated by the screening tool, however the Department of Defence will be included in the stakeholder database.

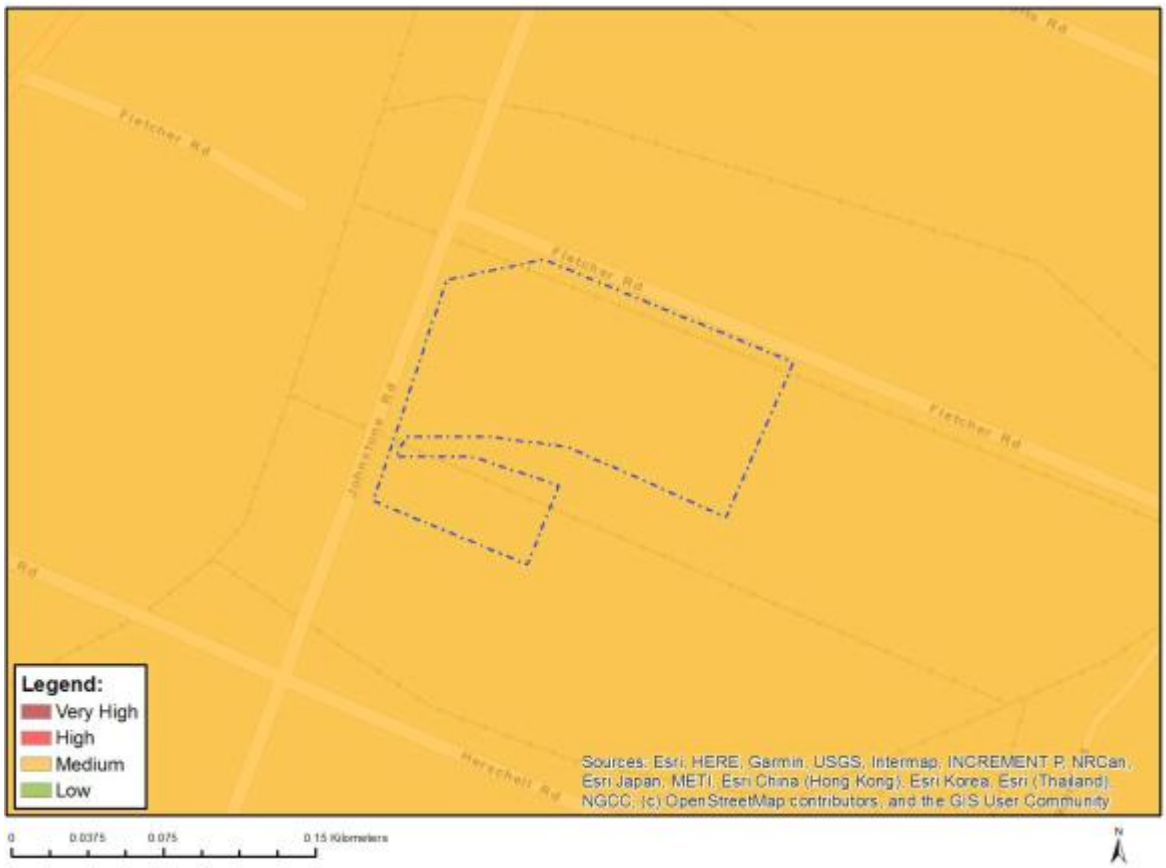


Figure 7-9 - Map of Defence Sensitivity

Source: DFFE Screening Report

8

ENVIRONMENTAL IMPACT ASSESSMENT

8 ENVIRONMENTAL IMPACT ASSESSMENT

This Chapter identifies the perceived environmental and social effects associated with the proposed Project. The assessment methodology is outlined in **Section 2.5**. The issues identified stem from those aspects presented in **Section 6** of this document as well as the Project description provided in **Section 3**.

Furthermore, a decommissioning assessment will be considered as part of the decommissioning process that will be subject to a separate authorisation and impact assessment process. The impact assessment in this section encompasses the geographical, physical, biological, social, economic, heritage and cultural aspects in accordance with Appendix 1 of GNR 326.

8.1 AIR QUALITY IMPACT ASSESSMENT

8.1.1 ANALYSIS OF EMISSIONS IMPACT ON HUMAN HEALTH

The main pollutants of concern at FFS TT, are discussed below.

8.1.1.1 Volatile Organic Compounds (VOCs)

VOCs easily vaporize from the solid or liquid phase into a gas. VOCs are released during fuel combustion (wood, coal, petrol or natural gas) and from solvents, paints, glues and other chemicals. They consist of a variety of chemicals that have both long term and short-term health effects. Many VOCs are hazardous air pollutants with their particular impacts determined by each compound's unique chemistry. Impacts from exposure to VOCs include eye, nose and throat irritation; headaches; nausea; dizziness; fatigue; skin allergies; damage to kidneys, liver and the nervous system; loss of coordination; and some VOCs are suspected to cause cancer. When combined with NOx, VOCs react to form ground level ozone, which is a component of photochemical smog and contributes to climate change (Seinfeld and Pandis, 1998; Colls, 2002; US EPA, 2011).

The key VOCs are further discussed below.

Benzene

Benzene (C_6H_6) in its purest form is a colourless liquid with an aromatic odour. Crude oil is the largest natural source of C_6H_6, with C_6H_6 being used in many products, including plastics, synthetic rubber, glues, paints, furniture wax, lubricants, dyes, detergents, pesticides and some pharmaceuticals (Government of South Australia, 2008). Inhaling very large amounts of C_6H_6 over a short period (5 – 10 min) can result in death. Exposure to lower concentrations can result in drowsiness, dizziness, headaches, tremors, confusion and unconsciousness. Long-term exposure can result in harmful effects of the tissues that form blood cells, especially bone marrow. C_6H_6 has been identified as a human carcinogen (Government of South Australia, 2008).

Ethyl-benzene

Ethylbenzene is a clear, colourless, volatile liquid under standard conditions. It is flammable and combustible at room temperature and standard atmospheric pressure. Ethylbenzene is a naturally occurring component of crude oil and is also formed during the combustion of organic materials. Ethylbenzene is primarily used as a precursor in the production of styrene and cellulose acetate, as well as being found in a large number of industrial, commercial and consumer products. Acute ethyl-benzene exposure following inhalation includes respiratory tract irritation, chest constrictions,

dizziness, vertigo and minor haematological changes. Ethylbenzene is thought to be a carcinogen, although research is ongoing (Alberta Environment, 2004).

Toluene

Toluene is a clear, colourless, volatile and flammable liquid under standard conditions. It is naturally occurring in crude oil and petroleum, as well as being formed during the combustion of organic materials. Toluene is widely used as a solvent in paints, varnishes, pesticide formations, printing inks, dyes, adhesives, sealants, cleaning agents, nail polish and for chemical extractions. After inhalation exposure, toluene is rapidly absorbed from the lungs and distributed to highly vascular tissues such as the brain. Symptoms of acute exposure progress from fatigue, headache and decreased manual dexterity to narcosis as exposure increases. Research has indicated that at concentrations of below 50ppm observable effects are few, although above 50ppm neurological impairment has been observed (Alberta Environment, 2004).

Xylene

Xylenes are monocyclic aromatic compounds with two methyl groups attached to a benzene ring. Xylenes are a naturally occurring component of all petroleum products and are also formed during the combustion of organic materials. Xylenes are predominantly used as an additive to petrol during blending to enhance the fuels octane rating, as well as being used as a solvent in paints, varnishes, pesticide formulations, vitamins, pharmaceuticals, printing inks, dyes, adhesives, cleaning agents and paint removers. Acute poisoning and death have been reported after overexposure or ingestion of substantial amounts, with an exposure level required for loss of consciousness approximately 10 000ppm (WHO, 1997). The major symptoms of acute human exposure include irritation of the nasal cavity, throat and eyes, and effects on the central nervous system including headaches, nausea, dizziness, difficulty in concentrating, impaired memory, slurred speech, fatigue, confusion and difficulties in breathing (Alberta Environment, 2004).

8.1.1.2 Particulate Matter

Particulate matter refers to solid particles suspended in the air. Particulates vary in size from particles that are only visible under an electron microscope to soot or smoke particles that are visible to the human eye. Particulate matter contributes greatly to deteriorations in visibility, as well as posing major health risks, as small particles (PM_{10}) can penetrate deep into lungs, while even smaller particle sizes ($PM_{2.5}$) can enter the bloodstream via capillaries in the lungs, with the potential to be laid down as plaques in the cardiovascular system or brain. Health effects include respiratory problems, lung tissue damage, cardiovascular problems, cancer and premature death. Acidic particles may damage buildings, vegetation and acidify water sources (USEPA, 2011).

8.1.1.3 Nitrogen Oxides

Under high temperature conditions in a boiler, nitrogen and oxygen atoms in the air react to form nitric oxide (NO). NO is a colourless gas that is non-toxic but is transformed into nitrogen dioxide (NO_2) when it is oxidised in the atmosphere. Elevated NO_2 concentrations may lead to asthma, emphysema, bronchitis, damage to lung tissue and even premature death. NO_x may lead to biological imbalances and mutations in vegetation, limits visibility and contributes to the formation of acid rain via the production of nitric acid (HNO_3). Further oxidation of NO_2 may lead to the formation of nitrate aerosols, which further limit visibility and affect the natural environment. Most importantly, however, NO_x contributes to the formation of tropospheric O_3, an important atmospheric oxidant, a

major air pollutant and a key greenhouse gas (Seinfeld and Pandis, 1998; Fenger, 2002; US EPA, 2011).

8.1.1.4 Sulphur Dioxide

SO_2 is produced via the combustion of sulphur rich fuel. SO_2 is a major respiratory irritant, resulting in respiratory illnesses, alterations in pulmonary defences and aggravation of existing cardiovascular disease. SO_2 may also create sulphuric acid as a result of its water solubility, producing acid rain. Once emitted, SO_2 may oxidize in the atmosphere to produce sulphate aerosols, which are harmful to human health, limit visibility and in the long term have an effect on global climate (Seinfeld and Pandis, 1998; Fenger, 2002; US EPA, 2011).

8.1.2 ANALYSIS OF EMISSIONS IMPACT ON THE ENVIRONMENT

The following sections analyse the potential impacts associated with air pollution on the surrounding environment.

8.1.2.1 Effects On Vegetation

Air pollution in South Africa was first identified as a potential threat to vegetation in 1988 (Tyson *et al*., 1988). The commercial forests of the eastern escarpment were highlighted as a threatened resource due to their proximity to the heavily industrialised Highveld. Marshal *et al.* (1998) also identified concerns around the potential impacts on crop yields on the Highveld. Air pollutants that could impact on vegetation include PM, SO_2, O_3, NO_x and hydrogen fluoride (HF).

The effects of pollution on plants include mottled foliage, 'burning' at leaf tips or margins, twig dieback, stunted growth, premature leaf drop, delayed maturity, abortion or early drop of blossoms, and reduced yield or quality. In general, the visible injury to plants is of three types: (1) collapse of leaf tissue with the development of necrotic patterns, (2) yellowing or other colour changes, and (3) alterations in growth or premature loss of foliage (Sikora and Chappelka, 2004). Factors that govern the extent of damage and the region where air pollution is a problem are (1) type and concentration of pollutants, (2) distance from the source, (3) length of exposure, and (4) meteorological conditions. Other important factors are city size and location, land topography, soil moisture and nutrient supply, maturity of plant tissues, time of year, and species and variety of plants. A soil moisture deficit or extremes of temperature, humidity, and light often alter a plant's response to an air pollutant (Sikora and Chappelka, 2004).

The closest area of vegetation is located approximately 3.5 km northwest from FFS TT. Based on the low concentrations predicted, impacts on vegetation are likely non-existent.

8.1.2.2 Effects On Animals

Air pollution is a recognized health hazard to domestic animals and wildlife. Industrial air pollutants effect both wild birds and mammals, causing notable decreases in local populations (Newman, 1979). The major effects include direct mortality, debilitating injury and disease, stress, anaemia, and bioaccumulation (Newman, 1979). Certain air pollutants are also known to cause variation in the distribution of certain wildlife species (Schreiber, and Newman, 1988). Animals are typically exposed to air pollution through a) inhalation of gases or small particles, b) ingestion of particles suspended in food or water, or c) absorption of gases through the skin (Burdo, 2018). Soft-bodied invertebrates (such as earthworms), or animals with thin, moist skin (such as amphibians) are the most susceptible to absorption of pollutants. Individual responses to pollutants are dependent on the type of pollutant involved, the duration and time of exposure, and the concentration taken up by the

animal (Wong and Candolin, 2015). The individual's age, sex, health, and reproductive condition also determines its response. There is much variability observed between animal classes, species, and even genotypes, in terms of the level of tolerance to a specific pollutant (Wong and Candolin, 2015).

FFS TT is located within a heavily industrialised area and in conjunction with the low concentrations predicted in the AIR, impact on animals are likely to be low. Important to note, all predicted concentrations were compliant with the NAAQS, which is the most stringent standard in recognising impacts on human health.

8.1.3 OPERATIONAL PHASE

This section of the report presents the predicted results of the atmospheric dispersion modelling conducted for FFS TT. The sources assessed in this study are fugitive emissions arising from storage tanks, small-fired heaters and loading/offloading activities. Concentrations results at specified receptors and the highest predicted off-site (beyond the site boundary) concentration are presented in tabular format, while concentration isopleths are presented graphically to indicate the dispersion of pollutants.

8.1.3.1 VOC Concentrations

Predicted VOC concentration associated with FFS TT at each discrete receptor and highest off-site concentration are presented in **Appendix G.1**. **Figure 8-1** presents the graphical output of the annual average modelled results. Importantly, in the absence of a VOC NAAQS or international guideline, all predicted VOC concentrations have been assumed to comprise 100% of C_6H_6 (Benzene) as a worst case scenario.

The following key findings are noted:

- Ambient annual VOC concentrations within the modelling domain are predicted to be compliant with the NAAQS for C6H6 at all sensitive receptors. The highest predicted annual average receptor concentration of 2.15E-02 ug/m3 was recorded at the closest sensitive receptor SR2 (STC Durban Campus), which is approximately 0.80km west from the boundary.
- The highest predicted off-site annual average VOC concentration (4.96 ug/m3) within the modelling domain is below the annual average standard for C6H6. This occurs 10 m south of the fenceline, with no sensitive receptors located in close proximity.
- Importantly, despite the worst-case scenario, all concentrations predicted at neighbouring sensitive receptors remain compliant with the relevant standard, as noted previously.

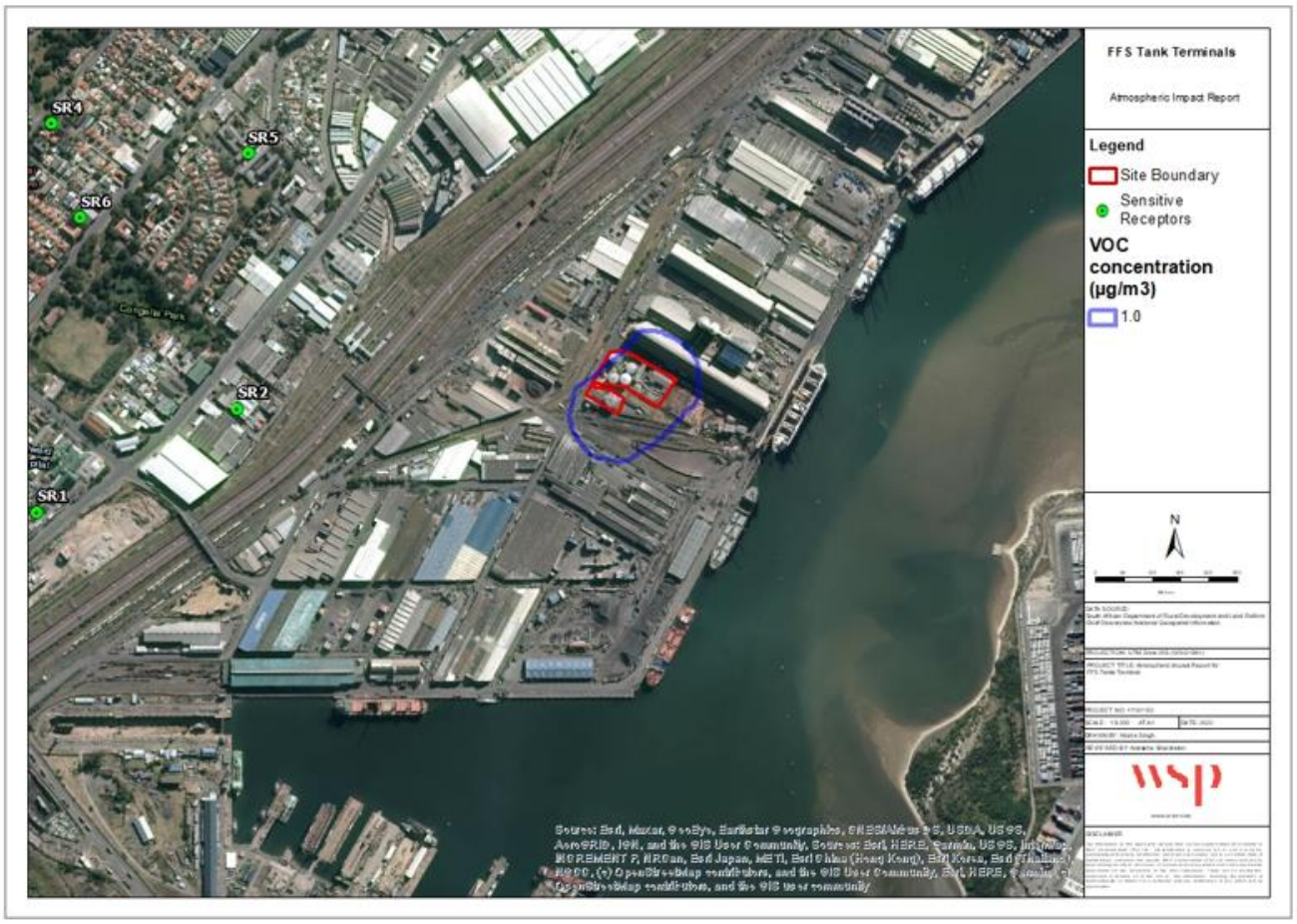


Figure 8-1 – Annual average VOC concentrations (µg/m^3)

8.1.3.2 PM_{10} Concentrations

Predicted PM_{10} concentrations associated with FFS TT at each discrete receptor and highest off-site concentrations are presented in **Appendix G.1**. **Figure 8-2** and **Figure 8-3** present graphical outputs of the 24-hour average and annual average modelled results, respectively.

The following key findings are noted:

- Ambient 24-hour (P99) PM10 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest receptor concentration (1.53E-01µg/m3) was recorded at the closest sensitive receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 24-hour (P99) PM10 concentration (5.93 µg/m3) within the modelling domain is compliant with the average 24-hour PM10 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.
- Predicted annual average PM10 concentrations within the modelling domain are compliant at all sensitive receptors. The highest receptor concentration (2.53E-02µg/m3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site annual average PM10 concentration (1.57 µg/m3) within the modelling domain is compliant with the annual average PM10 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.

Figure 8-2 – P99 24-hour average PM_{10} concentrations (µg/m^3)

Figure 8-3 – Annual average PM_{10} concentrations (µg/m^3)

8.1.3.3 $PM_{2.5}$ Concentrations

Predicted $PM_{2.5}$ concentrations associated with FFS TT at each discrete receptor and highest off-site concentration are presented in **Appendix G.1**. **Figure 8-4** and **Figure 8-5** present graphical outputs of the 24-hour average and annual average modelled results, respectively.

The following key findings are noted:

- Ambient 24-hour (P99) PM2.5 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest receptor concentration (3.84E-02µg/m3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 24-hour (P99) PM2.5 concentration (1.81µg/m3) within the modelling domain is compliant with the average 24-hour PM25 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.
- Predicted annual average PM2.5 concentrations within the modelling domain are compliant at all sensitive receptors. The highest annual receptor concentration (5.86E-03µg/m3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.

- The highest predicted off-site annual average PM2.5 concentration (0.5µg/m3) within the modelling domain is compliant with the annual average PM2.5 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.

Figure 8-4 – P99 24-hour average $PM_{2.5}$ concentrations (µg/m^3)

Figure 8-5 – Annual average $PM_{2.5}$ concentrations (µg/m³)

8.1.3.4 SO_2 Concentrations

Predicted SO_2 concentrations associated with FFS TT at each discrete receptor and highest off-site concentration are presented in **Appendix G.1**. **Figure 8-6, Figure 8-7** and **Figure 8-8** present graphical outputs of the 1-hour average, 24-hour average and annual average modelled results, respectively.

The following key findings are noted:

- Ambient 1-hour (P99) and 24-hour (P99) SO2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest 1-hour and 24 hour receptor concentration was recorded at the closest receptor SR2 (STC Durban Campus), with 3.11E+00µg/m3 and 1.19E+00µg/m3 respectively.
- Annual average SO2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest annual receptor concentration (1.82E-01 µg/m3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 1-hour (80.65 µg/m3), 24-hour (56.26 µg/m3) and annual average (15.80 µg/m3) SO2 concentrations within the modelling domain is compliant with the respective NAAQS. This occurs on the southern fenceline of the facility.

Figure 8-6 – P99 1-hour average SO_2 concentrations (µg/m^3)

Figure 8-7 – P99 24-hour average SO_2 concentrations (µg/m^3)

Figure 8-8 – Annual average SO_2 concentrations (µg/m^3)

8.1.3.5 NO_2 Concentrations

Predicted NO_2 concentrations associated with FFS TT at each discrete receptor and highest off-site concentration are presented in **Appendix G.1**. **Figure 8-9** and **Figure 8-10** present graphical outputs of the 1-hour average and annual average modelled results, respectively.

The following key findings are noted:

- Ambient 1-hour (P99) and annual average NO2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest 1-hour and annual average receptor concentration was recorded at SR2 (STC Durban Campus), with 1.91E+00 µg/m3 and 1.11E-01 µg/m3 respectively.
- The highest predicted off-site 1-hour (P99) (49.43 µg/m3)and annual average (9.68 µg/m3) NO2 concentrations within the modelling domain remains compliant with the respective NAAQS. This occurs on the southern fenceline of the facility, with no sensitive receptors located in close proximity.

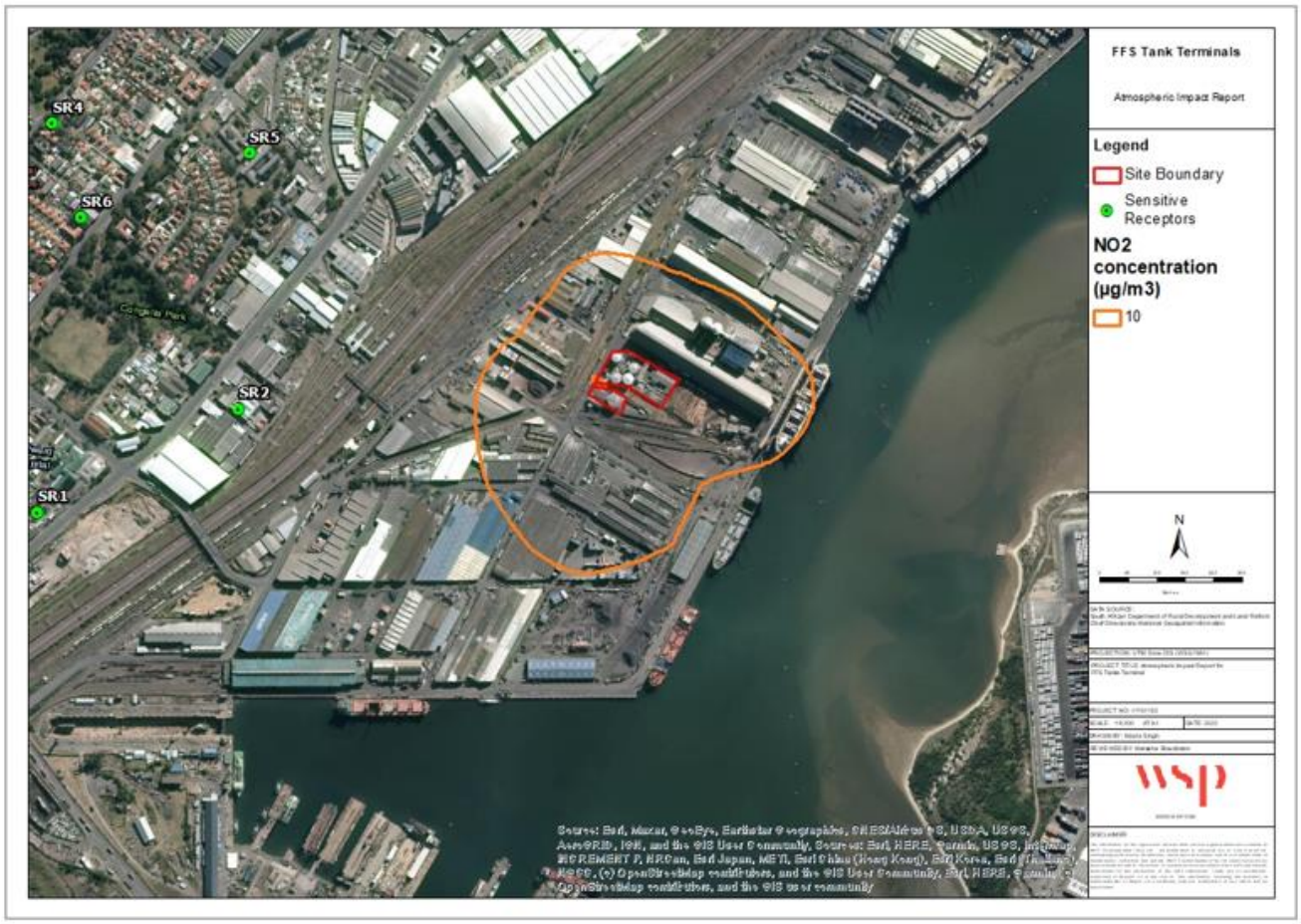


Figure 8-9 – P99 1-hour average NO_2 concentrations (µg/m^3)

Figure 8-10 – Annual average NO_2 concentrations (µg/m^3)

The purpose of this assessment is to identify the potential impacts and associated risks posed by the FFS TT. The outcomes of the impact assessment will provide a basis to identify the key risk drivers and make informed decisions on the way forward to ensure that these risks do not result in unacceptable social or environmental risk.

All impacts of the FFS TT operations were evaluated using a risk matrix, which is a semi-quantitative risk assessment methodology. This system derives an environmental impact level based on the extent, duration, potential intensity and probability of potentially significant impacts. The overall risk level is determined using professional judgement based on a clear understanding of the nature of the impact, potential mitigatory measures that can be implemented and changes in risk profile as a result of implementation of these mitigatory measures.

Key localised air quality impacts associated with the FFS TT operations include:

- Operational impacts of air emissions on sensitive receptors.

Outcomes of the impact assessment are contained within

Table 8-1 outlining the impact of each parameter and the resulting risk level. The resultant air quality risks for sensitive receptors were ranked “low” during the operational phase with and without mitigation.

Table 8-1 - Impact assessment of risks associated with FFS TT operations

Potential Impact: Operational impacts of air emission on sensitive receptors	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	1	1	3	3	**27**	**Low**	(-)
With Mitigation	2	2	1	3	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ In alignment with the AEL, BTEX passive badge monitoring should be undertaken once on an annual basis (i.e. summer season). ▪ Establish a procedure for periodic monitoring of fugitive emissions from pipes, valves, seals, tanks and other infrastructure components with vapour detection equipment, and with subsequent maintenance or replacement of components as needed. The procedure should specify the monitoring frequency and locations, as well as the trigger levels for repairs. ▪ All tanks should be visually inspected on a monthly basis utilizing document (DTT-CL19)[8] to confirm tank integrity. ▪ All tanks should be periodically inspected internally to determine tank integrity. The frequency of inspection should be undertaken based on conditions of the previous inspection. ▪ Maintaining stable tank pressure and vapour space. Ensure HFO and bitumen are offloaded at ambient temperature or temperatures well below their flash point. ▪ Spill prevention and control plan needs to be implemented. ▪ Reducing breathing losses by using white or other reflective colour paints with low heat absorption properties on the exteriors of storage tanks for lighter distillates (e.g. gasoline, ethanol, and methanol) or by insulating tanks. ▪ Vapours resulting from the storage tanks and loading activities should be treated with a vapour recovery unit. The vapour recovery unit should be modular to allow for future expansion. ▪ All spill absorbents/equipment used during a spill incident should be placed in a covered hazardous waste skip for disposal at a permitted and appropriate disposal site.							

[8] As per AEL recommendations

8.2 NOISE IMPACT ASSESSMENT

Noise levels during the construction phase will be absorbed by the existing noise climate, minimising the potential impact the noise could have on the surrounding environment. Owing to the transient nature of this impact, the industrial nature and current noise levels of the site, this impact is considered to be of low significance.

8.2.1 CONSTRUCTION PHASE

Table 8-2 – Impact from Demolition activities

Potential Impact: Potential noise impacts (Demolition activities)	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	2	1	3	2	1	**8**	**Very Low**	(-)
Mitigation and Management Measures	▪ Maintain vehicles and machinery in good working order as per the original equipment manufacturer; ▪ Equipment fitted with noise reduction components (mufflers and silencers) will be used where applicable as per operating instructions and maintained properly during operation; ▪ Equipment with a lower noise output should be selected where practical (e.g. electronic powered equipment typically has lower noise levels than equivalent diesel equipment); ▪ Investigate all complaints or observations of excessive noise and assess possibilities for mitigation; ▪ Notify neighbouring businesses on the commencement of demolish work; ▪ Avoid noisy activities at night-time and outside of normal weekend working hours where possible; and ▪ Employees / contractors are to be provided with appropriate hearing protection when undertaking work in noisy environments.							

Table 8-3 – Impact from construction noise

Potential Impact: Potential noise impacts (Construction activities)	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	2	1	3	2	1	**8**	**Very Low**	(-)

Mitigation and Management Measures	▪ Maintain vehicles and machinery in good working order as per the original equipment manufacturer; ▪ Equipment fitted with noise reduction components (mufflers and silencers) will be used as per operating instructions and maintained properly during operation; ▪ Equipment with a lower noise output should be selected where practical (e.g. electronic powered equipment typically has lower noise levels than equivalent diesel equipment); ▪ Investigate all complaints or observations of excessive noise and assess possibilities for mitigation; ▪ Notify neighbouring businesses on the commencement of demolishing work where applicable; ▪ Avoid noisy activities at night-time and outside of normal weekend working hours where possible; and ▪ Employees / contractors are to be provided with appropriate hearing protection when undertaking work in noisy environments.

8.3 TRAFFIC IMPACT ASSESSMENT

8.3.1 Measure of Effectiveness

The traffic performance of the intersections analysed was based on the Level of Service (LOS) concept. Level of Service (LOS) can be defined as a measure of congestion and delay at an intersection, with LOS A being the best (free flow, no congestion) and LOS F being the worst (breakdown conditions with very high delays).

Table 8-4 defines the Level of Service as a qualitative measure describing operational conditions within a traffic stream as defined in terms of delay experienced in seconds as per the aaSIDRA User Guide.

Table 8-4 – Level of Service Definitions

Level of Service	Signalised Intersections Stopped Delay (seconds)	Un-Signalised Intersections Total Delay (seconds)
A	< 10	< 10
B	> 10 and < 20	> 10 and < 15
C	> 20 and < 35	> 15 and < 25
D	> 35 and < 55	> 25 and < 35
E	> 55 and < 80	> 35 and < 50
F	>80	>80

8.3.2 Road Network Intersection Analysis

The aaSIDRA 7 software was used to analyse the intersections within the study area.

Results of the capacity analysis for the 2023 and 2028 Weekday morning and afternoon peak hour are presented in **Figure 8-11** and **Figure 8-12**, for the Background + Proposed Development traffic scenarios 1 and 2 (2023 AM & PM) and scenarios 3 and 4 (2028 AM & PM), respectively, whilst the full SIDRA outputs are given in **Appendix G.2**.

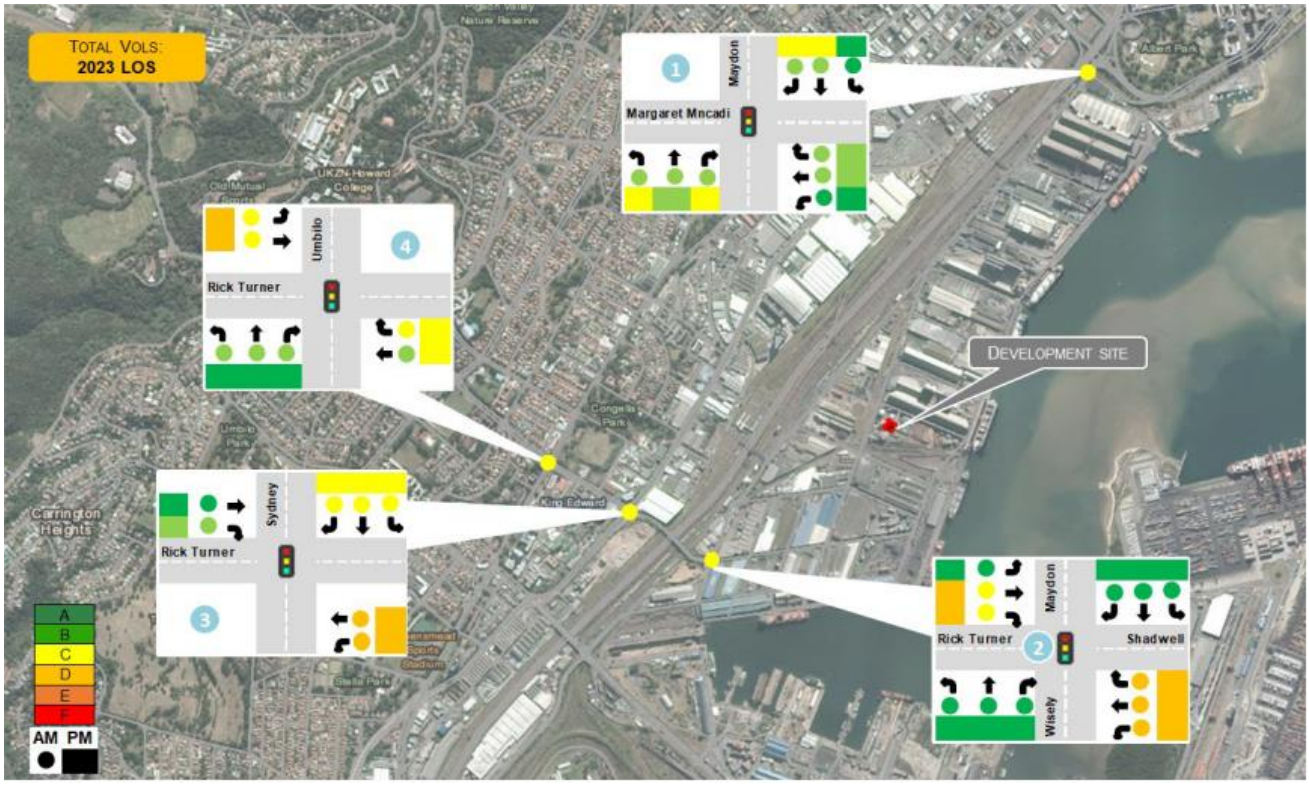


Figure 8-11 – 2023 Background with Development Traffic Analysis LOS Results

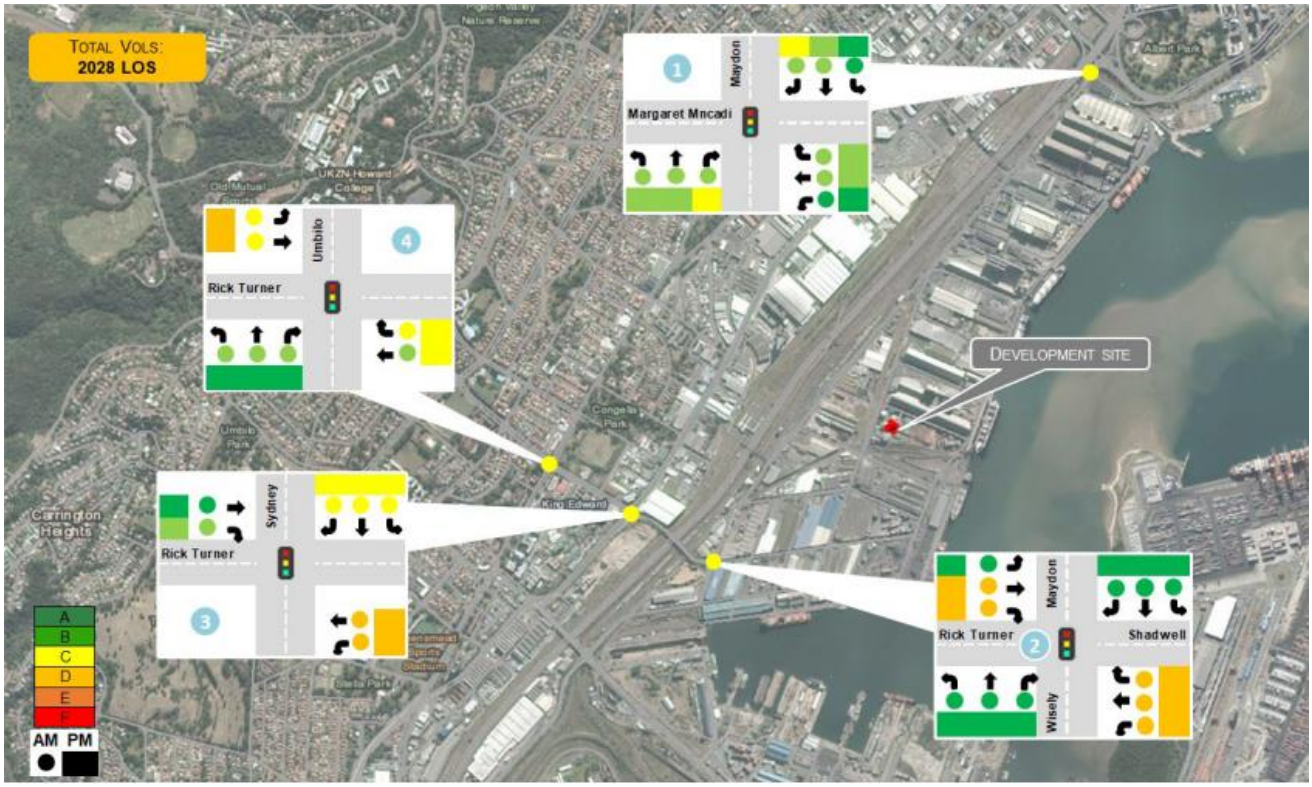


Figure 8-12 – 2028 Background with Development Traffic Analysis LOS Results

The following impacts have been identified for the construction and operational phases of the proposed project. The impacts associated with the construction phase, includes all demolition work.

8.3.3 CONSTRUCTION PHASE

The estimated additional traffic during the construction phase is expected to be eight construction vehicles per day. This, in association with some additional light vehicles for construction staff, will be insignificant to the existing traffic volumes and will have no noticeable impact on the traffic at all.

The main impact during the construction phase could be with regards to parking of construction vehicles along the public roads while they are not in service. This impact is predicted to be of low significance (without the implementation of mitigation measures). The mitigating measure proposed is to accommodate all the construction vehicles on site and not in Johnstone Road or Fletcher Road. This would then ensure that very little negative effects, with regards to traffic, will be experienced by other tenants of Maydon Wharf during the construction phase. The significance of this impact will remain low even with the implementation of mitigation measures.

Table 8-5 – Impact of Additional Traffic on adjacent road network during Construction Phase

Potential Impact: Impact of Additional Traffic on adjacent road network during Construction Phase	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	4	3	27	Low	(-)

With Mitigation	2	2	1	4	3	27	Low	(-)
Mitigation and Management Measures	▪ Accommodate all the construction vehicles on site and not in Johnstone Road or Fletcher Road							

8.3.4 OPERATIONAL PHASE

The second potential impact will occur with the full development. The impact of the additional operational heavy vehicles of seven vehicles in the peak hour is of low significance (without the implementation of any mitigation measures), and it does not have a negative impact on the existing intersections as there is ample capacity on the existing road network, based on the data and simulations.

Table 8-6 – Impact of Additional Traffic on adjacent road network during Operational Phase

Potential Impact: Impact of Additional Traffic on adjacent road network during Operational Phase	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	4	3	27	Low	(-)
With Mitigation	2	2	1	4	3	27	Low	(-)
Mitigation and Management Measures	▪ No mitigation measures required as the impact of the additional vehicles on the road network does not significantly affect the performance of the road network							

Stationary vehicles waiting to be serviced could become a potential negative impact on property access points in Johnstone Road. If not managed these, parked heavy vehicles, may block access points along Johnstone Road. However, this is not foreseen as a problem as a result of the second gantry service point, increasing the gantry capacity to a potential of ten (10) vehicles per hour. The key mitigation action is good logistics planning and loading scheduling be undertaken to reduce potential waiting of heavy vehicles within the road servitude. In addition, the second gantry service point will reduce the likelihood of this impact. It is however noted that the existing public roads are fairly wide with ample parking space on the shoulders should this be required due to unforeseen circumstances.

Table 8-7 – Impact of Additional Traffic waiting to enter site for loading/off-loading

Potential Impact: Impact of Additional Traffic waiting to enter site for loading/off-loading	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	1	4	3	30	Low	(-)
With Mitigation	2	2	1	4	2	18	Low	(-)

Mitigation and Management Measures	▪ The implementation of the 2nd loading/off-loading gantry. ▪ The application of good logistics planning and scheduling of heavy vehicles

8.4 SOCIAL IMPACT ASSESSMENT

8.4.1 CONSTRUCTION PHASE

- Impacts from expenditure on the construction and operation of the project (**Table 8**-8);
- Impacts associated primarily with the influx of people including job seekers (**Table 8-9**);
- Impacts on surrounding tenants and communities (**Table 8-10**).

Table 8-8 – Impact on local employment and household income during the construction phase

Potential Impact: Local employment and household income	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	3	3	2	5	55	Moderate	(+)
With Mitigation	4	3	3	2	5	60	Moderate	(+)
Mitigation and Management Measures	▪ Setting targets for how much local labour should be used based on the needs of the applicant and the availability of existing skills and people that are willing to undergo training. Opportunities for the training of unskilled and skilled workers from eThekwini should be maximized. ▪ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment. ▪ Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.							

Table 8-9 – Impact of influx of people during the construction phase

Potential Impact: Influx of people	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	2	3	33	Moderate	(-)
With Mitigation	2	2	3	2	3	27	Low	(-)

Mitigation and Management Measures	▪ A 'locals first' policy with regard to construction and operational labour needs. ▪ The community should be able to contact the site manager or his/her representative to report any issues which they may have. The site manager and his/her representative should be stationed within the area and should therefore be available on hand to deal with and address any concerns which may be raised. ▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes. ▪ The applicant and the contractors should develop a Code of Conduct for the project. The code should identify what types of behaviour and activities by workers are not permitted For example, access to land that is not part of the development will not be allowed. ▪ The applicant and the contractor should implement a Tuberculosis and HIV/AIDS awareness programme for all construction workers at the outset of the construction phase. ▪ Designate access for contractor personnel. No unauthorised access to other parts of the Wharf (those with restricted access), and control social areas during breaks.

Table 8-10 – Impact to surrounding tenants and communities during the construction phase

Potential Impact: Impact on surrounding tenants and communities during the construction phase	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	3	2	4	44	Moderate	(-)
With Mitigation	3	2	3	2	3	30	Low	(-)
Mitigation and Management Measures	▪ No construction workers, with the exception of security personnel, should be allowed to stay on the site overnight. ▪ The adjacent tenants should be able to contact the site manager to report any issues which they may have. The site manager should be stationed within the area and should therefore be available on hand to deal with and address any concerns which may be raised. ▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes. ▪ The applicant should develop a Code of Conduct for the project. The Code should identify what types of behaviour and activities by workers are not permitted. ▪ The movement of workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for							

	making the necessary arrangements for transporting workers to and from site on a daily basis where required. ■ The EMPr must outline procedures for managing and storing of waste on site.

8.4.2 OPERATIONAL PHASE

- Impacts on local employment and household income during the operational phase (**Table 8-11**);
- Impacts on surrounding tenants and communities during the operational phase (
-
-
- Table 8-12).

Table 8-11 – Impact on local employment and household income during the operational phase

Potential Impact: Impact on local employment and household income during the operational phase	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	2	1	5	3	27	Low	(+)
With Mitigation	2	2	1	5	3	30	Low	(+)
Mitigation and Management Measures	■ Setting targets for how much local labour should be used based on the needs of the applicant and the availability of existing skills and people that are willing to undergo training. Opportunities for the training of unskilled and skilled workers from local communities should be maximized, including those from adjacent suburbs who have indicated that they would like to benefit from the proposed project and its related opportunities. ■ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment. ■ Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.							

Table 8-12 – Impact of surrounding tenants and communities during the operational phase

Potential Impact: Impact of surrounding tenants and communities during the operational phase	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	3	36	Moderate	(-)
With Mitigation	2	2	3	4	2	22	Low	(-)
Mitigation and Management Measures	▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes.							

8.5 MAJOR HAZARD INSTALLATION ASSESSMENT

At high levels of fire radiation (37.5 kW/m^2) and explosion overpressure (35 kPa) process equipment integrity at nearby installations may be adversely affected.

8.5.1 OPERATIONAL PHASE

8.5.1.1 Pool Fires

It is likely that, if there is a spill of flammable liquids, a pool will form which will vaporize, releasing a plume of flammable gas. Such a plume could ignite some distance away and flash back to ignite the pool. The result will be a pool fire.

Base Oil / Fuel Oils

The 12.5 kW/m^2 MHI threshold, 1% lethality hazardous zone could extend up to 39 m from the source and may extend beyond the site boundary.

- Large circles: Fuel oil tank rupture (39 m effect zone radius) in **Figure 8-13** below.

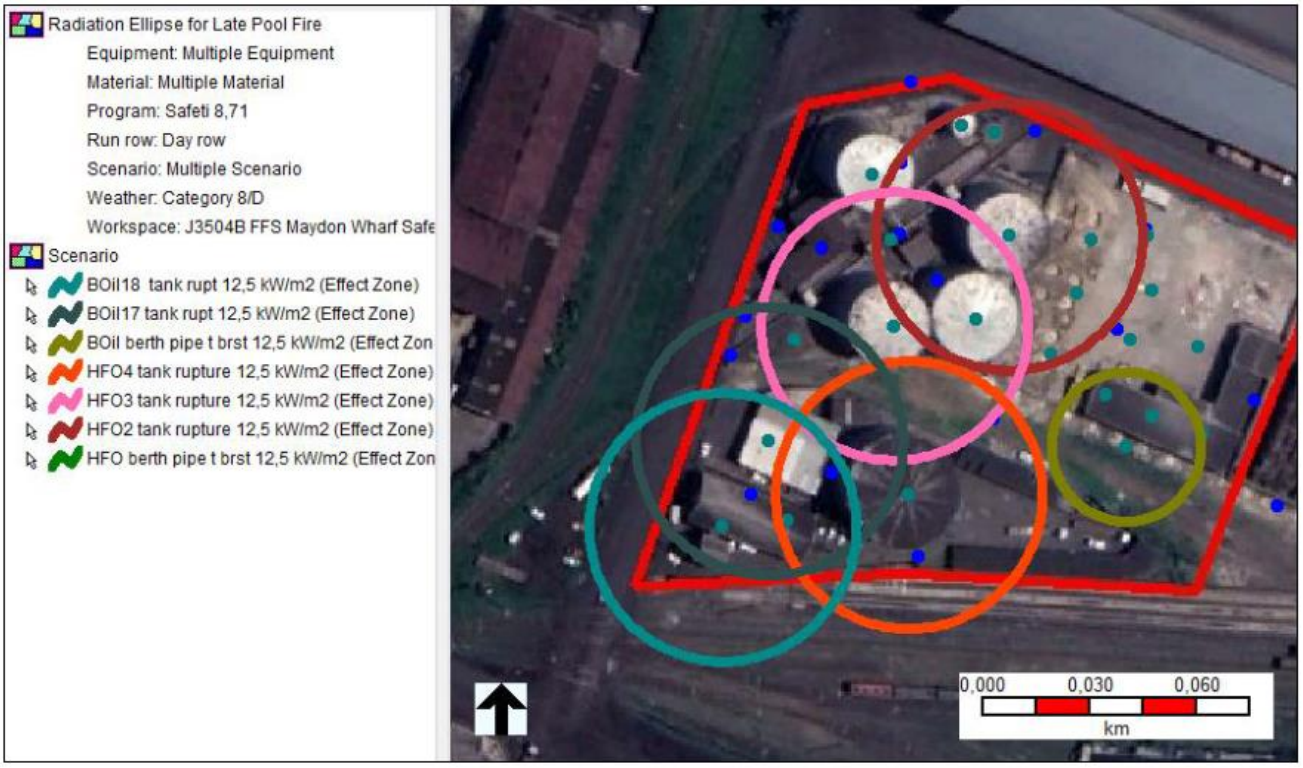


Figure 8-13 - Radiation circles for the 12.5 kW/m2 MHI threshold (1% lethality) events (Base Oil/Fuel Oil)

Table 8-13 – Impact from Pool fire (Base Oil/Fuel Oil)

Potential Impact: Pool fire - Base Oil/Fuel Oil	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	3	3	2	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified							

	▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.

Bitumen

The 12.5 kW/m^2 MHI threshold, 1% lethality hazardous zone could extend up to 42 m from the source and may extend beyond the site boundary.

- Large circles: Bitumen storage tank rupture (42 m effect zone radius) in **Figure 8-14** below

Figure 8-14 - Radiation circles for the 12.5 kW/m2 MHI threshold (1% lethality) events (Bitumen)

Table 8-14 – Impact from Pool Fire (Bitumen)

Potential Impact: Pool Fire - Bitumen	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	3	3	3	2	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.							

Glycols

The 12.5 kW/m^2 MHI threshold, 1% lethality hazardous zone could extend up to 67 m from the source and may extend beyond the site boundary.

- Light and dark brown circles: MEG storage tank rupture (67 m effect zone radius) in **Figure 8-15** below.

Figure 8-15 - Radiation circles for the 12.5 kW/m2 MHI threshold (1% lethality) events (Glycols)

Table 8-15 – Impact from Pool Fire (Glycols)

Potential Impact: Pool Fire - Glycols	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	3	3	2	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified							

	▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.

Paraffin

The 12.5 kW/m^2 MHI threshold, 1% lethality hazardous zone could extend up to 24 m from the source and may extend beyond the site boundary.

- Pink circle: Paraffin storage tank overfill (24 m effect zone radius) in **Figure 8-16** below.

Figure 8-16 - Radiation circles for the 12.5 kW/m2 MHI threshold (1% lethality) events (Paraffin)

Table 8-16 – Impact from Pool Fire (Paraffin)

Potential Impact: Pool Fire Radiation - Paraffin	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	3	**18**	**Low**	(-)
With Mitigation	2	1	3	2	2	**16**	**Low**	(-)

Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Emergency shut-off on road tanker ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.

8.5.1.2 Jet Fires

A jet fire occurs when a flammable fluid or gas is released under pressure from a relatively small aperture. This is likely to occur from a leak on the vessel or a line rupture.

No significant events expected for this site.

8.5.1.3 Fireball

In the case where a pressurised vessel containing liquified flammable gas burst due to a BLEVE, the boiling liquid vapour mixture is released up into the air and immediately ignited in a huge fireball. Burning liquid droplets rain down and the vapour explodes. The aerial fireball lasts for some period of time as the liquid in the air is burned. After the initial explosive effects (refer to the BLEVE case below) the radiation effects of this sustained fireball are very significant.

This is not expected for this site.

8.5.1.4 Flash Fires

A cloud of flammable vapour or mist released from a loss of containment event could extend well away from the source depending on the wind and weather conditions. Should a flammable cloud ignite, all persons within the envelope can be expected to suffer burn injuries. The flammable envelope is taken at half the Lower Flammable Limit to be conservative.

Class 3 Materials – Worst Cases

The 0.5 LFL MHI threshold, 1% lethality hazardous zone could extend up to 31 m from the source and may extend beyond the site boundary.

- Teal circle: HFO storage tank 4 large leak (31 m effect zone radius) in **Figure 8-17** below.

Figure 8-17 - Radiation circles for half the Lower Flammable Limit (0.5 LFL), the MHI threshold (Class 3 Materials – Worst Cases)

Table 8-17 – Impact from Flash Fires (Class 3 Materials – Worst Cases)

Potential Impact: Flash Fires – Class 3 – Worst Cases	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	3	3	2	3	**33**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations							

	▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.

8.5.1.5 Vapour Cloud Explosions

The release of flammable vapour could, under certain circumstances, provide sufficient vapour concentration to cause a vapour cloud explosion, should it be ignited. This scenario addresses both confined vapours, where vapours are trapped inside a building, as well as outside areas where there may be a measure of confinement due to large obstacle congestion. A delayed ignition vapour cloud explosion occurs after the cloud has drifted some distance before it ignites.

Class 3 Materials – Worst Cases

The 14 kPa MHI threshold, 1% lethality hazardous zone could extend up to 41 m from the source and may extend beyond the site boundary. Buildings within this radius may be affected, causing injuries and fatalities due to structural collapse or falling debris.

- Blue, Teal, Green circles: Bitumen and fuel oil storage tank large leaks (41 m effect zone radius) – worst-case events in **Figure 8-18** below.

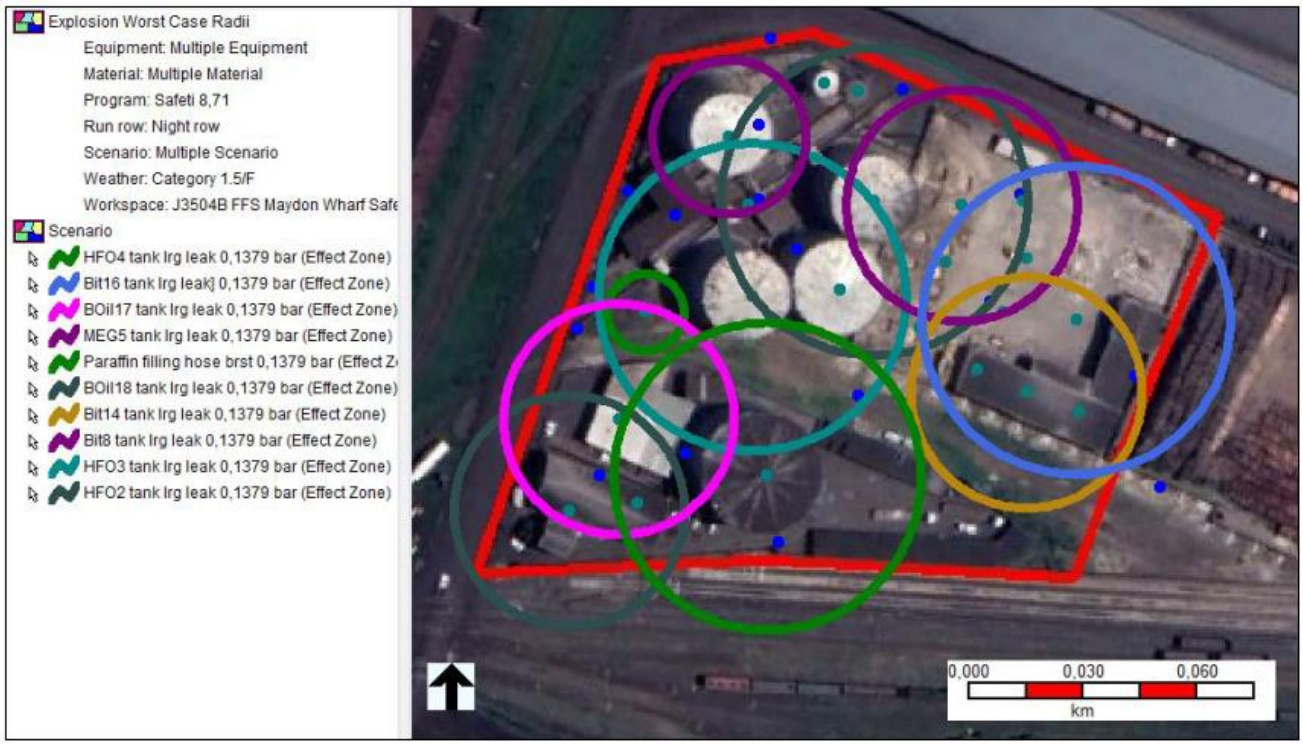


Figure 8-18 - Overpressure circles for the 14 kPa MHI threshold (1% lethality) events (Class 3 Materials – Worst Cases)

Table 8-18 – Impact from Vapour Cloud Explosions (Class 3 Materials – Worst Cases)

Potential Impact: Vapour Cloud Explosions – Class 3 – Worst Cases	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	3	3	2	3	**36**	**Moderate**	(-)
With Mitigation	3	2	3	2	2	**20**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.							

8.5.1.6 Toxic Events

No toxic events expected for this site.

8.6 CUMULATIVE IMPACT ASSESSMENT

8.6.1 AIR IMPACT ASSESSMENT

The National Framework for Air Quality Management in South Africa calls for air quality assessment in terms of cumulative impacts rather than the contributions from an individual facility. Compliance with the National Ambient Air Quality Standard (NAAQS) is to be determined by taking into account all local and regional contributions to background concentrations. For each averaging time, the sum of the model predicted concentration (C_P) and the background concentration (C_B) must be compared with the NAAQS. The background concentrations C_B must be the sum of contributions from non-

modelled local sources and regional background air quality. If the sum of background and predicted concentrations (C_B + C_P) is more than the NAAQS, the design of the facility must be reviewed (including pollution control equipment) to ensure compliance with NAAQS. Compliance assessments must provide room for future permits to new emissions sources, while maintaining overall compliance with NAAQS. For the different facility locations and averaging times, the comparisons with NAAQS must be based on recommendations in **Table 8-19**.

Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site. However, given the type of existing sources within the project study area, and the extremely low contributions predicted from the facility, it is likely that the VOC cumulative impacts will be insignificant/minimal.

Table 8-19 - Summary of recommended procedures for assessing compliance with NAAQS

Facility Location	Annual NAAQS	Short-term NAAQS (24 hours or less)
Isolated facility not influenced by other sources, C_B insignificant*.	Highest C_P must be less than the NAAQS, no exceedances allowed.	99th percentile concentrations must be less than the NAAQS. Wherever one year is modelled, the highest concentrations shall be considered.
Facilities influenced by background sources e.g. in urban areas and priority areas.	Sum of the highest C_P and background concentrations must be less that the NAAQS, no exceedances allowed.	Sum of the 99th percentile concentrations and background CB must be less than the NAAQS. Wherever one year is modelled, the highest concentrations shall be considered.

8.6.2 MAJOR HAZARD INSTALLATION ASSESSMENT

At high levels of fire radiation (37.5 kW/m^2) and explosion overpressure (35 kPa) process equipment integrity at nearby installations may be adversely affected.

Domino Effects Within the Site

Fires or explosions on site could cause failure of adjacent vessels or equipment, which could escalate the event.

Toxic events do not normally lead to direct domino failures.

Adjacent Major Hazard Installations

The installations on this site have the potential to impact on neighbouring hazardous installations, as well as hazardous installations on neighbouring sites and vice versa, could potentially be impacted upon by hazardous installations on neighbouring sites.

8.6.2.1 Pool Fires

Base Oil / Fuel Oils

The 37.5 kW/m^2 domino effect hazardous zone for Fuel oil is not reached and therefore not assessed.

Bitumen

The 37.5 kW/m^2 domino effect hazardous zone extends up to 37 m from the source and may impact other installations.

- Large circles: Bitumen storage tank rupture (37 m effect zone radius) in **Figure 8-19** below.

Figure 8-19 - Radiation circles for the 37.5 kW/m2 domino effects (Bitumen)

Table 8-20 – Impact from Pool Fires (Bitumen)(Cumulative)

Potential Impact: Pool Fires - Bitumen	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	3	3	2	3	**36**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted							

	▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.

Glycols

The 37.5 kW/m2 domino effect hazardous zone extends up to 50 m from the source and may impact other installations.

- Red and Gray circles: MEG storage tank rupture (50 m effect zone radius) in **Figure 8-20** below.

Figure 8-20 - Radiation circles for the 37.5 kW/m2 domino effects (Glycols)

Table 8-21 – Impact from Pool Fire (Glycols)(Cumulative)

Potential Impact: Pool Fires - Glycols	Magnitude	Extent	Reversibility	Duration	Probability	Significance	Character

Without Mitigation	4	3	3	2	3	**36**	**Moderate**	(-)
With Mitigation	2	2	3	2	2	**18**	**Low**	(-)
Mitigation and Management Measures	▪ Fire hydrants provided and can be used for cooling ▪ Fire water systems with piping towards tanks and gantries ▪ Pressure controlled emergency vents ▪ Overfilled material flows via piping into other tanks ▪ Stop-start pump for loading tankers ▪ Fire hydrants and extinguishers available and installed ▪ Alarms audible throughout the site. ▪ Emergency Planning and Response procedures up to date, with all personnel trained and drills conducted ▪ External emergency services notified and contracted where applicable ▪ Local authority notified of installations ▪ Neighbours to be notified ▪ Emergency equipment: • Fire suits • Fire hydrant with booster connection. • Mobile water cannons, firefighting foam. • Fire extinguishers • First aid sets ▪ Evacuation plan: • Alternate assembly points and site access gates, based on flow direction of spill.							

8.6.2.2 Vapour Cloud Explosions

Class 3 Materials – Worst Cases

The 37.5 kW/m^2 domino effect hazardous zone for fuel oil is not reached and therefore not assessed.

9

ENVIRONMENTAL IMPACT STATEMENT

9 ENVIRONMENTAL IMPACT STATEMENT

The essence of any impact assessment process is aimed at ensuring informed decision-making, environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA, the commitment to sustainable development is evident in the provision that “development must be socially, environmentally and economically sustainable…. and requires the consideration of all relevant factors…”. NEMA also imposes a duty of care, which places an obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take reasonable steps to prevent such damage. In terms of NEMA’s preventative principle, potentially negative impacts on the environment and on people’s environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be prevented altogether, they must be minimised and remedied in terms of “reasonable measures”.

In assessing the environmental feasibility of the proposed construction of the proposed Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate mitigation measures that should be implemented to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience, and the relevant legislation (where applicable).

Potential impacts associated with the proposed facility have been assessed and the significance of these evaluated with consideration of proposed mitigation measures. Due to the footprint and surround areas of the facility being greatly transformed, industrialised and containing hardstanding surfaces, a lack of suitable environmental features exist. Thus impact assessments were not conducted, but the status of the environmental conditions of the facility and surroundings were confirmed by site visits. Potential overall negative impacts were considered to be of low significance, positive impacts to the social-economic environment were also identified. The low significance of potential impacts was substantiated on the premise that EMPr measures would be implemented. Mitigation measures have been developed where applicable for the above aspects and are presented within the EMPr (**Appendix H**). It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

The BAR will be subject to public review, which will be undertaken according to the requirements of NEMA with every effort made to include representatives of all stakeholders within the process. The BAR will be updated and finalised taking into consideration all comments received during the public review period before being submitted to the CA for consideration.

9.1 IMPACT SUMMARY

A summary of the identified impacts and corresponding significance ratings for the proposed Facility is provided in **Table 9-1** below. With the implementation of the mitigation measures prescribed by the specialists, the impacts are rated as Low. **Figure 9-1** below illustrate the overall sensitivity of the site in relation to the Proposed Project.

Table 9-1 – Impact Summary

Aspect	Impact Description	Phase	Without Mitigation		With Mitigation	
Air Quality	Operational impacts of air emission on sensitive receptors	O	27	Low	24	Low
Noise	Potential noise impacts (Demolition activities)	C	27	Low	8	Very Low
	Potential noise impacts (Construction activities)	C	27	Low	8	Very Low
Traffic	Impact of Additional Traffic on adjacent road network during Construction Phase	C	27	Low	27	Low
	Impact of Additional Traffic on adjacent road network during Operational Phase	O	27	Low	27	Low
	Impact of Additional Traffic waiting to enter site for loading/off-loading	O	30	Low	18	Low
Social	Local employment and household income	C	55	Moderate	60	Moderate
	Influx of people	C	33	Moderate	27	Low
	Surrounding tenants and communities	C	44	Moderate	30	Low
	Impact on local employment and household income during the operational phase	O	27	Moderate	30	High
	Impact of surrounding tenants and communities during the operational phase	O	36	Moderate	22	Low
Major Hazard Installation	Pool fire - Base Oil/Fuel Oil	O	33	Moderate	18	Low
	Pool Fire - Bitumen	O	33	Moderate	18	Low
	Pool Fire - Glycols	O	33	Moderate	18	Low
	Pool Fire Radiation - Paraffin	O	18	Low	16	Low
	Flash Fires – Class 3 – Worst Cases	O	33	Moderate	18	Low
	Vapour Cloud Explosions – Class 3 – Worst Cases	O	36	Moderate	20	Low

Aspect	Impact Description	Phase	Without Mitigation		With Mitigation	
	Pool Fires – Bitumen (Cumulative)	O	36	Moderate	18	Low
	Pool Fires – Glycols (Cumulative)	O	36	Moderate	18	Low

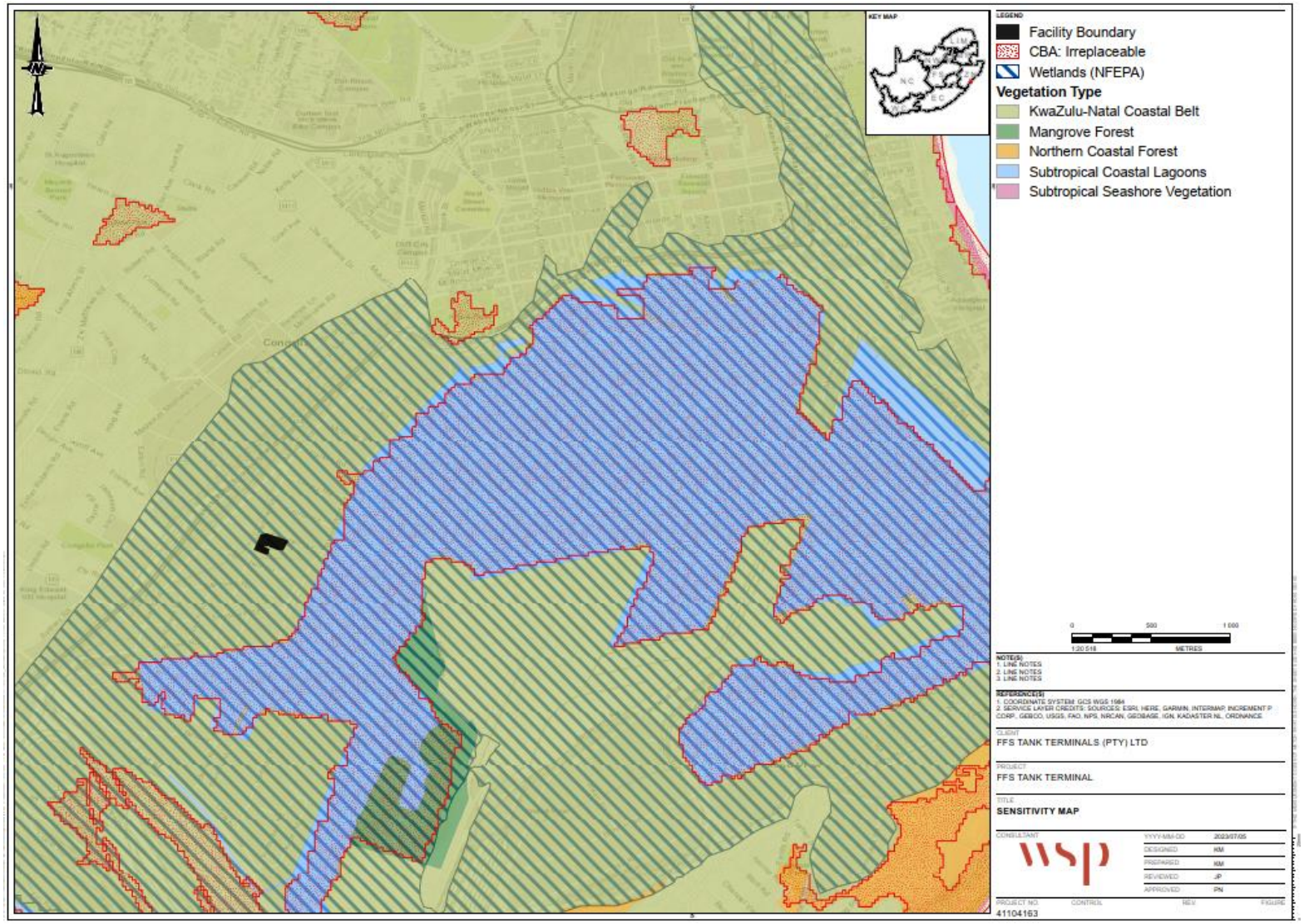


Figure 9-1 – Site Sensitivity Map

9.2 SPECIALIST CONCLUSIONS

9.2.1 AIR IMPACT ASSESSMENT

WSP has been appointed by FFS TT to undertake an amendment to their existing EA and AEL to allow for an increased storage capacity of bitumen, HFO IP, Biodiesel and slack wax. FFS TT proposes to expand their current tank storage by constructing additional tanks (14 additional tanks) and two small-fired heaters within their existing footprint of 12 415 m^2.

FFS TT is located within an industrial zone in the eThekwini Metropolitan Municipality, KwaZulu-Natal Province. The Facility has a storage capacity greater than 1000 m^3 of petroleum products and therefore triggers listed activity *Subcategory 2.4: Storage and handling of Petroleum Products* as per Government Notice Regulation 893 of 2013, promulgated in line with Section 21 of the National Environmental Management: Air Quality Act 39 of 2004 (NEM:AQA). A specialist Air Quality Impact Assessment (AQIA) in the form of an Atmospheric Impact Report (AIR) is required as part of the AEL application process, in alignment with the NEM:AQA: Regulations Regarding Air Dispersion Modelling (herein after referred to as the "*Modelling Regulations*"), Government Notice 533, in Government Gazette 37804 of 2014.

The dispersion modelling results indicated the following:

9.2.1.1 VOC concentrations

- Ambient annual VOC concentrations within the modelling domain are predicted to be compliant with the NAAQS for C_6H_6 at all sensitive receptors. The highest predicted annual average receptor concentration of 2.15E-02 ug/m^3 was recorded at the closest sensitive receptor SR2 (STC Durban Campus), which is approximately 0.80km west from the boundary.
- The highest predicted off-site annual average VOC concentration (4.96 ug/m^3) within the modelling domain is below the annual average standard for C_6H_6. This occurs 10 m south of the fenceline, with no sensitive receptors located in close proximity.
- Importantly, despite the worst-case scenario, all concentrations predicted at neighbouring sensitive receptors remain compliant with the relevant standard, as noted previously.
- Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site.

9.2.1.2 PM_{10} Concentrations

- Ambient 24-hour (P99) PM_{10} concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest receptor concentration (1.53E-01µg/m^3) was recorded at the closest sensitive receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 24-hour (P99) PM_{10} concentration (5.93 µg/m^3) within the modelling domain is compliant with the average 24-hour PM10 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.
- Predicted annual average PM_{10} concentrations within the modelling domain are compliant at all sensitive receptors. The highest receptor concentration (2.53E-02µg/m^3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site annual average PM_{10} concentration (1.57 µg/m^3) within the modelling domain is compliant with the annual average PM10 NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.

- Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site.

9.2.1.3 $PM_{2.5}$ Concentrations

- Ambient 24-hour (P99) $PM_{2.5}$ concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest receptor concentration (3.84E-02µg/m^3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 24-hour (P99) $PM_{2.5}$ concentration (1.81µg/m^3) within the modelling domain is compliant with the average 24-hour $PM_{2.5}$ NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.
- Predicted annual average $PM_{2.5}$ concentrations within the modelling domain are compliant at all sensitive receptors. The highest annual receptor concentration (5.86E-03µg/m^3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site annual average $PM_{2.5}$ concentration (0.5µg/m^3) within the modelling domain is compliant with the annual average $PM_{2.5}$ NAAQS. This occurs 8m south of the fenceline, with no sensitive receptors located in close proximity.
- Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site.

9.2.1.4 SO_2

- Ambient 1-hour (P99) and 24-hour (P99) SO_2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest 1-hour and 24 hour receptor concentration was recorded at the closest receptor SR2 (STC Durban Campus), with 3.11E+00µg/m^3 and 1.19E+00µg/m^3 respectively.
- Annual average SO_2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest annual receptor concentration (1.82E-01 µg/m^3) was recorded at the closest receptor SR2 (STC Durban Campus), which is located 0.80km west from the boundary.
- The highest predicted off-site 1-hour (80.65 µg/m^3), 24-hour (56.26 µg/m^3) and annual average (15.80 µg/m^3) SO_2 concentrations within the modelling domain is compliant with the respective NAAQS. This occurs on the southern fenceline of the facility.
- Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site.

9.2.1.5 NO_2

- Ambient 1-hour (P99) and annual average NO_2 concentrations within the modelling domain are predicted to be compliant at all sensitive receptors. The highest 1-hour and annual average receptor concentration was recorded at SR2 (STC Durban Campus), with 1.91E+00 µg/m^3 and 1.11E-01 µg/m^3 respectively.
- The highest predicted off-site 1-hour (P99) (49.43 µg/m^3)and annual average (9.68 µg/m^3) NO_2 concentrations within the modelling domain remains compliant with the respective NAAQS. This occurs on the southern fenceline of the facility, with no sensitive receptors located in close proximity.

- Cumulative impacts associated with FFS TT were not assessed due to the lack of good quality baseline monitoring data representative of the site.

Based on the findings of this assessment, impacts on the surrounding sensitive receptors as a result of activities taking place at FFS TT are considered to be low.

In WSP's professional opinion and based on the findings of this AIR, and recommendations provided, the proposed expansion at FFS TT can be authorised.

9.2.2 TRAFFIC IMPACT ASSESSMENT

- The development is expected to result in an increase in the number of trucks servicing the facility, with the least number of expected heavy vehicles estimated at 32 in a 24-hour period and the most (worst case) number of expected heavy vehicles estimated at 60 in a 24-hour period. The existing facility currently generates approximately 30 heavy vehicles in a 24-hour period.
- The analysis results shows that after the new development generated traffic has been added to the Background traffic in 2023 Weekday morning and afternoon peak hours, the total development generated traffic will have no significant impact on the surrounding road network. The intersections analysed in the study area are anticipated to operate satisfactorily with no approach worse than LOS D during both the 2023 Weekday morning and afternoon peak hours and with negligible increases in delay.
- The analysis results shows that after the new development generated traffic has been added to the Background traffic in 2028 Weekday morning and afternoon peak hours, the total development generated traffic will have no significant impact on the surrounding road network. The intersections analysed in the study area are anticipated to operate satisfactorily with no approach worse than LOS D during both the 2028 Weekday morning and afternoon peak hours and with negligible increases in delay.
- The proposed development is expected to generate a total of 35 new PCU trips (used in the analyses) on the immediate surrounding road network during the Weekday morning and afternoon peak hours with 18 in : 17 out (7 HGV trips).
- Existing Gantry Facility:
    - The existing ingress off Fletcher Road and egress off Johnstone Road will remain to serve the existing operations at the three gantries on the application site. The existing berths have a length of approximately 80m that serves the three gantries in tandem. The first gantry is located approximately 25m away from Fletcher Road within the development site which is deemed an adequate distance to accommodate the length of a HGV.
- Proposed New Gantry Facility:
    - The Developer proposes to provide an additional gantry facility with access off Fletcher Road. The new gantry will be serviced by two loading/off-loading berths that would also provide stacking for two HGV's.
- Total Gantry Capacity:
    - The existing gantry facility (3) and proposed new gantry facility (2) has the capacity to service 10 (HGV) vehicles per hour (each gantry point has a service rate of 2 veh/hr). This equates to the estimated total vehicles generated by the total development in the peak hour (10 HGV's). However, it is recommended that good logistics planning and loading scheduling be undertaken to reduce potential waiting of heavy vehicles within the road servitude. It is

however noted that the existing public roads are fairly wide with ample parking space on the shoulders should this be required due to unforeseen circumstances.

- The accesses to the development site would be a priority-controlled intersection, with priority given to Johnstone Road and Fletcher Road.
- The ingress and egress points will have a minimum width of 6.0 metres.
- The ingress and egress points will be designed in accordance with the eThekwini Transport Authority's standards and specifications.
- The minimum shoulder sight distance for a Stop Condition access point on a road with a design speed of 40 km/h is approximately 50.0 metres. Thus, the line of sight of 50.0 metres must be maintained at the Access points of the development site, in both directions along Fletcher Road and Johnstone Road.

- The key mitigation action is good logistics planning and loading scheduling be undertaken to reduce potential waiting of heavy vehicles within the road servitude. In addition, the second gantry service point will reduce the likelihood of this impact. It is however noted that the existing public roads are fairly wide with ample parking space on the shoulders should this be required due to unforeseen circumstances.

9.2.3 MAJOR HAZARD INSTALLATION ASSESSMENT

9.2.3.1 Classification

The FFS Tank Terminals Maydon Wharf site was classified as a medium hazard site, based on the classification as per Ishecon recommendation letter of 10 April 2023, and ratified by FFS Tank Terminals.

9.2.3.2 Consequence Analysis

Table 9-2 indicates installations on the FFS Tank Terminals Maydon Wharf site could potentially have off- site effects:

Table 9-2 – Potentail Worst Case Incidents

Material And Installations	Worst-Case Incident	Distance Of Lethal (MHI) Effects (M)
Glycol storage tanks	MEG storage tank rupture – pool fire	67
Bitumen storage tank	Bitumen storage tank rupture – pool fire	42
Base oil / Fuel oils	Fuel oil storage tank large leak – vapour cloud explosion	41
Paraffin storage tank	Paraffin storage tank overfill – pool fire	24

The installations on this site have the potential to impact on neighbouring hazardous installations, as well as hazardous installations on neighbouring sites and vice versa, could potentially be impacted upon by hazardous installations on neighbouring sites.

9.2.3.3 Risks

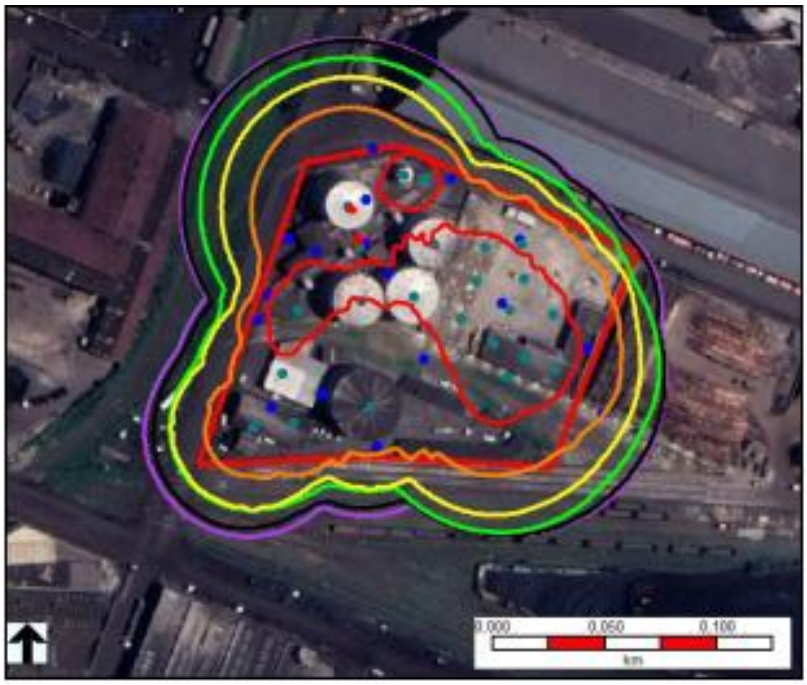


Figure 9-2 – Risk Contours

- Onsite risk (employee risk): tolerable, provided the facility has ensured that risk is as low as reasonably practicable (ALARP) (i.e. Risk>1E-5 and <1E-3 deaths/person/year).
- Offsite risk at the site boundary (risk to public): tolerable, provided the facility has ensured that risk is as low as reasonably practicable (ALARP) (i.e. Risk>1E-6 and <1E-4 deaths/person/year).
- Risk to the nearest residences/sensitive receptors: broadly acceptable (i.e. Risk<1E-6 deaths/person/ year).
- Risks are broadly acceptable beyond ±35 m from the site boundaries.
- Societal risks are tolerable. The maximum number of fatalities for a worst-case scenario could be up to 11 persons. The likelihood of this is less than once in ten million years.

9.2.3.4 Land Use Planning

- Since there could be offsite effects, the Transnet National Ports Authority and Town Planning should be made aware of which areas could be affected, in order to manage the approval of new developments in the vicinity of this MHI.
- The following land use planning restrictions have been suggested as indicated in **Figure 9-3** and **Table 9-3**:

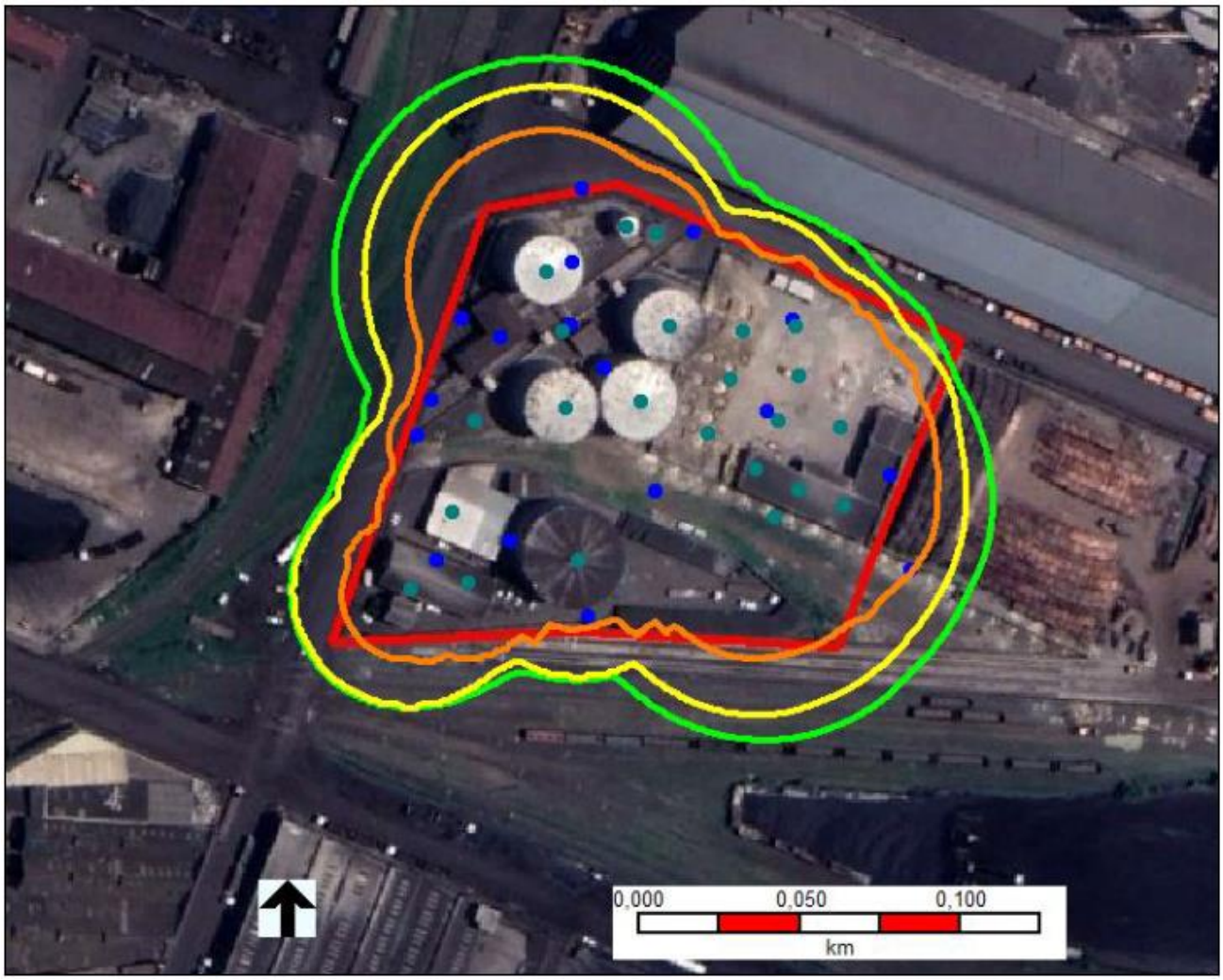


Figure 9-3 – Map of Land Use Planning Zones

- ORANGE – within the orange contour is the Inner Zone (up to 22 m from site boundary)
- YELLOW – between the yellow and the orange contour is the Middle Zone (up to 35 m from site boundary)
- GREEN – between the green and the yellow contour is the Outer Zone (up to 44 m from site boundary)

Table 9-3 – Land Use Planning Restrictions

Development Type	Description	Suggested Separation Distance
Industrial use	Workplaces with buildings with <100 occupants and <3 storeys per building.	No land-use planning restrictions
	Workplaces containing buildings with >100 occupants and 3 or more storeys per building.	Not within the orange contours (22 m from site boundary)

Residential	Any housing developments, even those with less than 30 dwellings per hectare, except small in-fill projects of one or two units which could be allowed.	Not within the orange contours (22 m from site boundary)
	High density developments such as large blocks of flats, informal housing, etc.	Not within the yellow contour (35 m from site boundary)
Other	Hospitals, old-age homes, crèches, schools, large outdoor entertainment facilities (theme parks, sports stadia), etc.	Not within the green contour (44 m from site boundary)

9.2.3.5 Emergency Plan

- An on-site emergency plan is available for the site, and suggestions for improvement have been made. Most importantly, the plan should be reviewed taking the findings of this report into account, with regular reviews there-after, ensuring it complies with the SANS 1514:2018 – Major Hazard Installation – Emergency Response Planning.
- In terms of the MHI regulations, off-site emergency planning is the responsibility of the local authorities, with involvement from the operating personnel at the facility when developing the plan.

9.3 CONDITIONS AND RECOMMENDATIONS

The following key aspects are recommended to be included as conditions of authorisation:

- The layouts submitted in the Draft BAR are not finalised. The final layouts are to be submitted to the EDTEA for approval prior to construction;
- The site-specific EMPr submitted in the Draft BAR is to be approved. The EMPr is to be updated to include the final layout map once finalised and approved by EDTEA;
- The EMPr and BAR mitigation measures must be adhered to;
- If any recommendations for the layout is provided by the relevant specialists, this must be implemented as far as possible;
- The final EMPr must form part of all contractual documents with contractors during construction and operational phases of the project. Furthermore, a dedicated Environmental Control Officer (ECO) must be appointed to ensure compliance to all EA conditions and EMPr commitments throughout the construction phase, with monthly/two-monthly inspections and reporting to EDTEA;
- Appropriate reporting must be submitted to AMAFA as per Permit Ref: 21/246, issued on 12 December 2021.

The following specialist recommendations have been made in respect of the project:

9.3.1 AIR IMPACT ASSESSMENT:

Based on modelling predictions, WSP recommends the following measures:

- In alignment with the AEL, BTEX passive badge monitoring should be undertaken once on an annual basis (i.e. summer season).

- Establish a procedure for periodic monitoring of fugitive emissions from pipes, valves, seals, tanks and other infrastructure components with vapour detection equipment, and with subsequent maintenance or replacement of components as needed. The procedure should specify the monitoring frequency and locations, as well as the trigger levels for repairs.
- All tanks should be visually inspected on a monthly basis utilizing document (DTT-CL19)9 to confirm tank integrity.
- All tanks should be periodically inspected internally to determine tank integrity. The frequency of inspection should be undertaken based on conditions of the previous inspection.
- Maintaining stable tank pressure and vapour space. Ensure HFO and bitumen are offloaded at ambient temperature or temperatures well below their flash point.
- Spill prevention and control plan needs to be implemented.

In addition to previously stated recommendations, the following section provides best practice options on further mitigating emissions :

- Reducing breathing losses by using white or other reflective colour paints with low heat absorption properties on the exteriors of storage tanks for lighter distillates (e.g. gasoline, ethanol, and methanol) or by insulating tanks.
- Vapours resulting from the storage tanks and loading activities should be treated with a vapour recovery unit. The vapour recovery unit should be modular to allow for future expansion.
- All spill absorbents/equipment used during a spill incident should be placed in a covered hazardous waste skip for disposal at a permitted and appropriate disposal site.

9.3.2 TRAFFIC IMPACT ASSESSMENT:

- The proposed expansion of the FFS Tank Terminals Fuel Storage and Handling Facility, situated at 14 Fletcher Road. Maydon Wharf, Durban is expected to have a negligible impact on the road network within the surrounding area. It is therefore recommended that the application be approved from a Traffic and Transportation perspective.
- The following conditions are to be adhered to on submission of the Building Plan application:
    - The accesses to the development site would be a priority-controlled intersection, with priority given to Johnstone Road and Fletcher Road.
    - The ingress and egress points will have a minimum width of 6.0 metres.
    - The ingress and egress points will be designed in accordance with the eThekwini Transport Authority's standards and specifications.

9.3.3 MAJOR HAZARD INSTALLATION

- Based on the medium hazard classification: compile and implement a Major Incident Prevention Policy for FFS Tank Terminals Maydon Wharf, as contemplated in the Occupational Health and Safety Act No. 85 of 1993, as amended, MHI Regulations 2022, regulation 11 and Annexure C. The due date for this is 31 January 2026.

[9] As per AEL recommendations

- As a minimum, the duty holder regulatory requirements summarised in Appendix 5.4 of the MHI Report should be noted and implemented.
- This report should be submitted by the responsible person to the site duty holder and Health and Safety Committee for review and to oversee that the recommendations of this report are scheduled and addressed; the identified risks evaluated, and risk reduction measures are scheduled, budgeted and implemented within a reasonable timeframe.
- A copy of the risk assessment must be available on the site at all times for inspection by the relevant authorities.
- Notification requirements and evidence should be reviewed and updated as per the regulatory requirements summarised in Appendix 5.4 of the MHI report. The due date for this is 31 January 2025.
- Review the risk assessment before the 2028 re-assessment if or when the installation(s) are modified, changed or expanded, or any incidents take place that activated the MHI aspects of the emergency procedures.
- Individual risks to members of the public were found to be tolerable, provided the facility has ensured that risk is as low as reasonably practicable (ALARP) (i.e. Risk>1E-6 and <1E-4 deaths/person/year), while societal risk was found to be tolerable. Therefore, reasonable risk reduction measures should be investigated and implemented. Additional measures identified by the facility management, should be investigated and implemented where feasible.
- Update the Process Safety Management system to address the findings and recommendations of the MHI report.
- Emergency Planning recommendations:
    - Communicate the findings of this report to adjacent establishments, along with the emergency measures and method of warning alert. Keep records of these communications.
    - Review the on–site emergency procedure based on the findings of this report and to comply with the requirements of SANS 1514. The due date for this is 31 January 2024.
    - Keep a register of all incidents and near miss incidents related to the operation of the establishment.
    - Notify the local emergency services, Provincial and National authorities within 48 hours of any incidents that activated the emergency procedures.
    - FFS Tank Terminals should communicate with the local emergency services to ensure that they are aware of the emergencies which may take place at the site and assist them in compiling an off-site plan. The due date for this is 31 January 2025.

10

CONCLUSION AND WAY FORWARD

10 CONCLUSION AND WAY FORWARD

The overall objective of the BA is to provide sufficient information to enable informed decision-making by the competent authorities. This was undertaken through consideration of the proposed project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

It is the opinion of WSP that the information contained in this document (read in conjunction the EMPr) is sufficient for EDTEA to make an informed decision for the environmental authorisation being applied for in respect of this Project.

Mitigation measures have been developed, where applicable, for the above aspects and are presented within the EMPr. It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

Considering the findings of the respective studies, no fatal flaws were identified for the proposed Project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the environmental aspects is expected to be low. It is thus the opinion of the EAP that the Project can proceed, and that all the prescribed mitigation measures and recommendations are considered by the issuing authority.

WAY FORWARD

This Draft BAR is available for review from **07 July 2023** to **06 August 2023**. All issues and comments submitted to WSP will be incorporated in the Comments and Responses Table of the SER.

The Draft BAR will be updated with all comments and submitted as a Final BAR to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

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Appendix A

EAP CV

Appendix B

EAP DECLARATION

Appendix C

SPECIALIST DECLARATION

Appendix D

STAKEHOLDER ENGAGEMENT REPORT

Appendix E

KWAZULU-NATAL AMAFA & RESEARCH INSTITUTE PERMIT

Appendix F

DFFE SCREENING TOOL REPORT

Appendix G

SPECIALIST STUDIES

Appendix G.1

AIR QUALITY IMPACT ASSESSMENT

Appendix G.2

TRAFFIC IMPACT ASSESSMENT

Appendix G.3

MAJOR HAZARD INSTALLATION ASSESSMENT

Appendix H

EMPR

Appendix I

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